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PART I.

ORIGINAL CORRESPONDENCE.

ART. X.—*Essay on Rotation of Crops; by* J. HAMILTON COUPER; *read before the Union Agricultural Society.**

THE difference of effect produced on the fertility of the soil, by the spontaneous growth and by the artificial culture of plants, is so strickingly contrasted, as to present itself very forcibly to all observant minds. Where nature is allowed to sow her own seeds and to reap her own harvests, the earth, instead of being impoverished by her vegetable productions, seems at each new effort but to augment that fertility, which is ever presenting to the eye a varied aspect of beauty and fruitfulness. But very different has been the effect in most countries, where man has controlled the productions of the soil, and limited them to those alone which contribute to the gratification of his wants, conveniences and luxuries. Their exhaustion generally follows production, and utter impoverish-

* This excellent Essay on the Rotation of Crops we obtained from Mr. Couper, during our late agricultural excursion into Georgia. It was not originally designed for publication, but having solicited, and obtained a copy, we now have the pleasure of presenting it to our readers. The subject is one of great importance to us, and ought to command the attention of every agriculturist. Circumstances prevented Mr. Couper from extending the essay as far as was originally intended, he has, however, promised us to resume the subject as soon as his leisure will permit.—*Ed. So. Agr.*

ment would succeed to teeming fertility, were not resort made to benign nature, or to expensive manures, to restore the lost fertility.

Is this contrast the necessary effect of the peculiar character of the plants which have been selected for cultivation? is it owing solely to cultivation; or has it arisen from a vicious system of agriculture, in relation to both? The continued and increasing fertility of some countries, where these plants are most extensively grown; and where cultivation is carried to the greatest perfection, proves that the impaired productiveness of the soil, is not necessarily the result of the two first causes, whatever may be their tendency; and that it is chiefly attributable to the effect of a vicious system.

The great error of this system has been, that man, instead of following the golden maxim of Lord Bacon, of conquering nature by obeying her laws, has endeavoured, in opposition to those laws, to force her into a subservience to his own views. Had he observed the changes of vegetation which were spontaneously occurring around him, he would have perceived, that of the seeds of plants, which are scattered with a lavish hand over the earth, those to which the soil and climate were most congenial, and which found the greatest supply of food fitted to their support, obtained the mastery in the contest for existence; and continued to flourish, until having reduced or exhausted those principles of nourishment peculiar to themselves, they abandon the soil to others, to which it still afforded the elements of unimpaired luxuriance. These in their turn, having occupied it for a time, gave way to more successful rivals. Thus the earth, forever occupied by plants, to the growth of which it is best adapted, presents the greatest mass of vegetation, which, under existing circumstances, it is capable of bearing; and by their decayed remains and their ceaseless change, the exhaustion of any principle is soon restored, and the fertility of the soil is preserved unimpaired. Here the seeds of plants are abundantly thrown on the lap of the earth, and unerring nature selects those which it is best fitted to bear.

But such has not been the course pursued by man. Of the plants spontaneously produced by nature, he has made a selection: and has wisely aimed at the extension of those best adapted to his use. But his want of skill has

marred his own wishes. Ignorant of the principles of vegetation, he has consigned to the earth that which it was not fitted to bear; or if at first fitted, his avarice has induced him to continue the cultivation, until it was no longer so. The soil has been tortured to produce what it refused; and it has been refused that which it could produce. Man laboured: the earth was impoverished; and scanty products were the precursors of others still more so.

Happily this gloomy result is not the necessary consequence of the cultivation of those plants, which minister most to the comforts of man. The progress of information, and the important discoveries of the laws of vegetation, which scientific research has made, during the last half century, have gradually led to a correction of vicious practices. And the establishment of sound principles in most of the departments of husbandry, now prove, that the cultivator may pursue an uninterrupted succession of useful crops, and at the same time maintain the soil in a state of unimpaired fertility.

This result is mainly attributable to the imitation of the principle of change, which constitutes the great and economical law of vegetable production: an imitation which has led to the most important practice of modern husbandry, the rotation of crops.

I have thought that I could not better fulfil the duty which has devolved upon me, by the appointment of this Society to prepare an essay upon some subject connected with agriculture, than by attempting a succinct developement of the principles upon which the rotation of crops is founded; to illustrate those principles by the practices of the most celebrated agricultural districts; and to suggest a few hints for a succession of crops for our own country. If in this discussion I am led beyond the legitimate bounds of an essay, I must throw myself on the indulgence of the Society, who will, I trust, pardon the trespass on their time, in consideration of the extent and intricacy of the subject, and of its importance in reference to the peculiar deficiences of our own agriculture.

The problem to be solved by the theory of a rotation of crops is, to ascertain by what combination or succession of crops, the soil may be kept in the highest state of im-

provement, and at the same time be made to yield the greatest net production, for a series of years.

The first object of the rational cultivator, will be to select the most valuable crops, which the peculiar circumstances of his climate, soil and situation admit of. He will further have reference to his own wants, and the demand which arises from markets.

But when he has ascertained the crops which, under these circumstances, are the most valuable, the soil may not be sufficiently enriched to produce them in the greatest abundance: or if sufficiently fertile, the crops may be of a nature so exhausting, as to have a tendency to impair it. He will, therefore, in order to maintain his land in the highest state of improvement, be under the necessity, either of adopting crops less exhausting; of cultivating the exhausting crops less frequently; or of supporting the fertility of his soils by manures.

Where extraneous supplies of manures can be obtained, as from a vicinity to towns, mineral manures, marshes, irrigation, &c., a course of exhausting crops may be followed, without impairing the fertility of the soil; and the judicious cultivator will avail himself of these extraordinary means of enrichment. But as these favourable situations are comparatively few, and as the investigation of the question will be simplified, by omitting any allusion to them, it may be assumed as a general principle, that every soil, from its own productions, must be made to maintain its own fertility.

The successful application of this principle, depends upon a knowledge of the manner in which vegetables in general, tend to exhaust or enrich the soil; and of the nature more or less exhausting of each vegetable.

Plants do not, by the mere effect of their vegetation, impregnate the earth with any fertilizing principles.—Their ameliorating influence results entirely from the mechanical action on the soil; the beneficial operation of a peculiar mode of cultivation, during their growth; and the return to the earth of their decayed remains.

As all plants do, to a greater or less degree, subtract alimentary substances from the land in which they grow, were the whole of their vegetation removed from it, all plants would be impoverishing. Their enriching tendency, will depend upon the return to the soil, on their decay,

of more of the principles of vegetation, than they have subtracted from it, during their growth.

Were all plants alike in their organization and vegetation, their comparative enriching effects would be in the relative proportion of their vegetation removed from the soil on which they grew, to that returned to it. And to the period of their growth at which it was removed. But this is not the case, for vegetables are found to differ essentially, in their exhausting effects, agreeably to their peculiar character, and to the particular mode of culture which they require.

The food of vegetables is found diffused through the soil; or floating in the atmosphere. And plants derive their nourishment, in part by their roots from the principles contained in the soil on which they are fixed; and in part by their leaves and succulent bark, from the atmosphere which surrounds them.

Vegetables having a system of large, succulent leaves, and much open and tender bark, absorb the greater part of their nourishment from the atmosphere. While those with firm and narrow leaves, and close and hard bark, derive their support chiefly from the soil.

It will be obvious from the enunciation of these principles that, by the cultivation of vegetables with a system of large leaves and tender bark, a greater mass of vegetation can be produced, with a given expenditure of the fertilizing principle of the soil, than by the growth of those with narrow leaves and compact bark, since a greater portion of the nutriment of the former is derived from the atmosphere.

It is further obvious that, as vegetables with a system of large leaves, draw much more of their food from the atmosphere than from the soil, if they be returned wholly, or in greater part, to the soil, it will receive more of the principles of fertility than it has lost; and that their tendency must be eminently enriching. On the contrary, as plants with a system of narrow leaves receive their nourishment principally from the soil, if the greater part of their product be removed from it, that which is restored to the earth is less than what has been taken from it, and their effect will be exhausting.

The different proportions, in which different vegetables derived their nourishment from the soil and atmosphere, is

considerably influenced by the changes which they undergo in their organization during their growth. Before the period of flowering, a greater proportion of their nutriment is derived from the atmosphere. But the reverse takes place during the maturing of the seed. The proportion of food derived from the soil while the seeds are ripening, also depends much upon the peculiar character, and the changes which the other parts of the plant undergo at that time. The more oleaginous and farinaceous the seeds, and the greater their weight in comparison with the other parts of the vegetable, the greater is the proportion of nutritive principles furnished by the soil. This is still more increased when the leaves, bark, and other spongy parts of the plant, become dried up about the period of flowering, and the nourishment requisite to the perfecting of the seeds, is necessarily derived entirely through the roots, from the soil.

From the review of these principles of vegetable physiology, we arrive at the practical inference, that by the cultivation of crops with systems of large leaves, the soil is less exhausted, than if it be made to produce those with narrow leaves: that if the broad-leaved plants are cut before the period of flowering, they are still less exhausting, than if allowed to mature their seeds: and that if the product of their vegetation be returned wholly, or in greater part to the soil, they become eminently fertilizing. Hence they have been called ameliorating crops. On the contrary, as narrow-leaved crops are highly exhausting, the more particularly when they are allowed to mature their seeds; and these seeds and much of their other products are removed from the soil, they have been denominated exhausting crops. With a knowledge of these principles, and of the character of the plants which he cultivates, the agriculturalists is enabled to maintain a proper degree of fertility in his soil. If his land be poor, he will cultivate more ameliorating and fewer exhausting crops, until it is sufficiently enriched. If sufficiently enriched, he will maintain it in that state by his ameliorating crops, which are a source of manure to restore to the soil, those principles of vegetation which have been subtracted from it by the exhausting crops. This is to be accomplished either, immediately, by ploughing in the ameliorating crops; or mediately, by employing them as food

for cattle, and applying the products of the farm-yard in the form of manure.

This interchange of broad and narrow-leaved crops, constitutes one of the most important principles of a rotation of crops. Its application to practice is, however, to be modified by the circumstances which are about to be mentioned.

We have just seen that vegetables are separated into two classes, in reference to the organs by which they derive their food from the atmosphere. The same utility results from a classification with respect to those by which they take it up from the soil. Hence they have been divided into tap and tuberous, and fibrous rooted plants. The roots of the first class penetrate far into the earth, subtract their nourishment principally at a great depth, and divide the soil by their mechanical action. The latter extend themselves near the surface, draw their food from it, and tend to bind the soil. It results from the different action of these two systems of roots, that their interchange will be mutually advantageous; and that an economy of manure will be obtained by it, for when the surface of the soil becomes exhausted and unable to support the fibrous rooted crop, its subtratum may still afford an abundant pasture to plants capable of reaching it, by their tap or tuberous roots.

But independently of the quality in vegetables of withdrawing more or less of their nourishment from the soil, in consequence of the peculiar structure of their leaves and roots, experience has proved that every plant has a habit of vegetation peculiar to itself, which by its action on the soil, after a certain period, renders it unfit to reproduce that particular vegetable, until a restoration has been effected of those peculiar principles of which it has been exhausted. Experience has also proved that, although a soil may be thus exhausted and unfit to produce one vegetable, it may be still in a state highly favourable to the growth of many others. These facts are firmly established by the change of plants which is incessantly renewing and beautifying the vegetable covering of the earth; by the alternation of the trees of our forests, so familiar to us all; by the succession of grasses on meadows; and by the daily observation of all practical agriculturalists. But while the fact is confirmed beyond the possibility of doubt,

it is to be regretted that this is one of the secrets of vegetation upon which scientific research has shed the least light. In lamenting the want of that clear perception of principles, which is so necessary to the direct and useful application of knowledge, it is, however, satisfactory, that enough has been established to prove that in the interchange of plants of different habits of vegetation, there is a positive economy of the alimentary principles contained in the soil; and consequently that by it a greater product can be drawn from a given amount of manure, than by the continued culture of the same plant.

The effect of plants in exhausting the soil of those principles peculiarly adapted to their support, will obviously be greater the longer they have been cultivated. And in whatever way those principles are restored, it is evident that the time taken to accomplish it, will bear a ratio to that in which they have been exhausting. It is also evident that, if the recurrence of the same plant, on the same field, proves injurious, the succession of those approaching each other in character will also be so, to an extent, varying with their greater or less affinity.

From these views results one of the leading principles of a rotation of crops that, the return of the same vegetable, of the same field, or of vegetables approaching each other in character, should be removed as far as possible.

By a judicious succession of broad and narrow-leaved crops; of fibrous and tap-rooted plants; and by an interchange of vegetables of different characters, the cultivator will be able to adapt his crops to the actual state of the fertility of his soil; and at the same time, to maintain it in a progressive state of improvement.

But in obtaining this he has not accomplished all that is required. The order of his crops may be such, as not to admit of stirring the earth, and of drawing it up to the growing plant; operations which are absolutely necessary to the eradication of weeds; which permit the free admission into the soil of dew and heat, and of the gases, and finer particles of nourishment which constitute, or are found suspended in the atmosphere; and which while by a minute division of the soil they make it more absorbent of moisture, at the same time prepare it for the more ready escape of whatever is superfluous: operations, in fine, which contribute eminently to the luxuriance of the

growing plant, and to the prosperity of subsequent crops; and which have been found to conduce essentially to the preservation of the fertility of the soil.

An attention to these points leads to a selection of such a rotation as will alternate crops which offer facilities in weeding and stirring the soil with others which do not: and to commence with a cleansing crop whenever the land is foul with weeds, or is likely to be made so, by the application of manures containing their seeds.

As some plants require a greater degree of fertility of soil to effect their full developement than others; and as they require those principles of fertility to be in different states of preparation, and to a certain extent of different kinds, the cultivator will perceive the necessity of applying his manure to the most exhausting crop; and so to arrange the others, as that they may follow in the most favourable succession. Such a succession, as will prevent that useless expenditure of manure, which results from conveying, at one time, to the plant more than it can consume; and which must, therefore, in great part, be dissipated and lost in the atmosphere: or which takes place, when the manure is in such a state, that its fertilizing principles are brought into operation, at a period too early, or too late, to meet the exigences of the growing plant.

Such are the principles of the convertible husbandry derived from the laws of vegetation. There are others founded on the economy of labour, of time, and of means.

The practical agriculturalist will feel the necessity of making such an arrangement, that the labour of preparing the soil, and sowing, cultivating, harvesting, and getting his crops ready for market, may follow in easy, regular, and economical succession. And that it shall be such, as to require the least expenditure of manure and tillage, which may be consistent with a state of the greatest productiveness.

He will also keep in mind that his profits depend upon the economical employment not only of labour, but of time and space. He will, therefore, leave his land unoccupied by a crop as short a time as possible and increase his products by the frequent introduction of double or secondary crops. To this course, he will be the more strongly impelled, when he reflects, that, animal and vegetable

manures, being volatile, are rapidly evaporated into the atmosphere, whenever the surfice of the soil, in which they are contained, is exposed to the action of the sun; that this subtraction of the fertility of the soil is greatest, when there are no vegetables to be benefited by it; and that it is, therefore, one of pure loss, unattended by any equivalent or peculiar advantage of immediate production, or of remote amelioration. He will not allow his soil to clothe itself with a spontaneous growth: for then that fertility is expended in useless weeds which might be converted into valuable crops, and the selection of the plants, which should be the result of choice, is left to chance: a chance which is likely to intermingle exhausting with ameliorating vegetables, with salutary grasses, baneful weeds, whose ill effects, from the deposit of their seeds, will extend to subsequent crops.

(*To be continued.*)

ART. XI.—*On the Culture of Corn with the Plough, unassisted by the hoe; by* THOMAS PARKER.

"Rocky-Grove, Abbeville, December 10, 1832.

Dear Sir,—Up to the period at which I emigrated from the lower country to this district, the plough was but little used as an agricultural implement in that section of country with which I was acquainted, the chief (I might say the whole) reliance being on the hand hoe; whereas, in the upper country, crops are made principally with the plough. Not being acquainted with what alterations may have taken place in the use of agricultural implements since that period in the lower country, I have thought that a statement of my mode of cultivating Indian corn with the plough, unassisted by the hoe, might not be unacceptable to some of your readers. As far as circumstances will permit, I observe the following rotation in the culture of my crops. First year small grain, second year cotton, and third year Indian corn.

As sweet potatoes are not extensively cultivated among us, they form no part of a rotatory crop. That part of my corn crop which succeeds cotton, is cultivated entirely with the plough, without the use of the hoe; but if I am compelled to plant any part of my corn after small grain, the hoe in such a case, I find indispensable, as the crop which succeeds small grain will be infested with weeds, and some of them will escape the plough, especially such as have sprung up near the corn hills. For this reason, as well as from the circumstance that the cut-worm is destructive to the young corn when that crop follows small grain, I prefer planting cotton after small grain and corn after it.

In preparing for a corn crop, I break up the land with mould-board ploughs, where they can be used, as deeply, as thoroughly, and as early in the winter as possible, that the frosts may mellow the ground; for if this operation is not well done, it is fruitless to expect a good crop, unless the seasons are indeed very favourable. A few days before I commence planting, I lay off my corn-fields in furrows, at the usual distances, with a gofer or bull-tongue plough, but do not, as in common practice, ridge thereon. Being now ready for planting, I cross these furrows with others, being very careful to make them cross each other at right-angles; to ensure which, I personally superintend and direct the laying off of the first cross-furrow in each field or division, as this furrow regulates the rest, and as I have found by experience that if this is left to negroes they will, (even the most careful of them) frequently make a wrong start, and consequently lay off the whole field catacornered, (a very common and expressive word, though not to be found in the dictionary) rendering it incapable of being worked to advantage, and causing mortification and vexation to the agriculturist as often as he views it. The droppers follow the ploughs (as they lay off these cross-furrows) and drop the corn, which is immediately covered by running a furrow on each side with a narrow gofer or bull-tongue plough, made out of wagon tire iron, run at such a distance from the corn, as that whilst they cover the corn they do not form a sharp ridge over it, or cover it too deeply. I thus ridge my ground sufficiently for all useful purposes, and cover the corn by the same operation. In this way all the labour of covering the corn with the hoe is saved; and I hesitate not to

affirm, from the result of repeated experiments, that corn so covered will come up with more regularity, and require less replanting in a given number of years than that which is covered with the hoe.

I will offer a few reasons why this result might be expected. First, a careless hand will often in covering with the hoe displace the corn, the bad consequences of which are so evident where the crop is to be worked with the plough that they need not be pointed out. Secondly, some hills will be covered too deeply, when from the coldness of the earth in the early part of the year, much of it will rot, especially if the spring should be a late and cold one; and thirdly, because, give what orders you may, the labourers when they cover the corn will generally push or draw the hoe over the hill with a view to level it, or from habit, which by somewhat packing the soil, and filling the little crevices with fine earth, will cause it to bake or form a hard crust over the corn should a beating rain fall before it comes up, through which crust much of the corn will not penetrate. This, at least, will certainly be the case in stiff soils, and such as are disposed to run together after a rain and bake. It will, also, *sometimes* happen, be as careful as you may, where hogs are raised as a part of the farm stock that the pigs or small shoats will find some hole to get in at, and when the field is ridged up before planting, and the corn covered with the hoe, the pigs will root up hill after hill with astonishing expedition, being guided to the spot from the appearance of the ground as well as by their noses, and may do considerable mischief before they are discovered; whilst by ridging and covering at one and the same operation, they are put completely at fault as regards the assistance of their eyes, and guided alone by their noses they will be discovered before they do much mischief.

One remark about dropping the corn. In doing this, I put my most intelligent and careful hands to it, differing from some who trusts this to mere boys and girls, and for this simple reason, that the greater the exactness is with which the corn is dropped in is proper place, the easier and better can the crop be worked by the plough. As soon as possible after the corn is well up, I give it, its first working by running a furrow on each side of it with a gofer plough of the usual size, and plough the middles

with a mould-board plough, assigning to my best ploughmen, and most careful hands the duty of running the furrows next the corn, that the young corn may not be carelessly covered and yet ploughed as close to as possible. The next ploughing is done with mould-board ploughs, as the corn is now sufficiently high to enable a careful hand to throw the soil up to it and cover the young grass about it. The more indifferent ploughmen plough the middles. When I plough the corn the third time I have it ploughed as close and as much soil thrown up to it as possible, and the middles or alleys again well ploughed, and if this ploughing is done well with proper implements, any grass about the corn is now destroyed, and the corn well moulded or hilled with earth. The fourth or last ploughing I give when the corn is about or has commenced tasseling. I now neither plough near the corn nor deep, my object being to destroy young grass, loosen and move the soil on top. A plough called the scraper is, I think, the best for this purpose. This is the mode of culture I pursue in ordinary or wet seasons, but if at the time the corn should receive its third working, it is suffering from a long and severe drought, I do not think it expedient to plough the ground deeply or very close to the corn, but to use the scraper; but in such case a hill should then be put to the corn with the hoe, or this may be done at the last working.

The soil I cultivate is a close soil, requiring to be kept well stirred, as after every rain it runs more or less together, according as the rain is more or less hard and beating. If I plant corn in very cloddy ground, I then ridge before I plant, and think it advisable to cover with the hoe instead of the plough.

Respectfully,

THOMAS PARKER.

ART. XII.—*Account of several premium crops of Corn and Potatoes, with Observations; by* Dr. CHARLES W. CAPERS.

Dear Sir,—I would have sooner sent you the account of the quantity of corn produced upon an acre of ground, for which prizes have been given by the St. Helena Island Agricultural Society for several years past, but being desirous o f sending also the mode of culture (which I have been unable to obtain,) has caused the delay. These papers went into the hands of a committee, and cannot be found. I have, therefore, taken the following from the minutes of the society of which I am secretary.

On the 3d of December, 1829, Mr. Benjamin Chaplin, jun. obtained the premium, he having produced to the acre 53¾ bushels of flint corn. On the 2d of December, 1830, Mr. Chaplin again obtained the premium, having produced that year 73 bushels to the acre. Mr. Joseph Hazel also stated that he had produced to the acre 69½ bushels.

Mr. Alexander Cocheroft, the same year obtained the premium for root potatoes, having produced 9087 lbs. upon one task, (80 lbs. to the bushel) and of slip potatoes, 13255 lbs. upon the half of an acre. Mr. William Pope, jun. stated that he had produced 10100 lbs. upon the same space of ground. The following year the Society increased the quantity of corn to 75 bushels, in order to obtain the premium: no one to my knowledge has yet certified that he has produced that quantity.

The method, these gentlemen pursued, as far as I can recollect, was by selecting good land and manuring highly with compost and cotton seed, and working the land very often. From the result of these experiments I have drawn this conclusion, that a small quantity of land may be attended in this manner with profit, but in an extensive field it would be too laborious and expensive; and I must also add, that the great quantity of manure used in these cases would not be advantageous during a dry and warm season. Our rainy seasons generally commence about the last of June or first of July, sometimes a little later; and our most judicious planters generally divide the times of planting their corn. The first is planted in March, the last in April. Should the drought

be protracted to a late period, the leaves dry up or fire as they here term it, the silk perishes, the farina is scattered about to no purpose, and we have a cob with scarcely a kernel of corn upon it. It is true, that cotton-seed is not only an auxiliary as a manure, but assists very much in keeping the plant in a green and flourishing state, yet the quantity used is so great that it becomes a question whether after all it could be employed to any extent. I consider the flint corn grown upon our islands and the neighbouring mainland, as the best which I ever saw produced in any part of the United States. From the month of November until June it sells with us, *communibus annis*, for fifty cents. After that period, until the new crop is gathered in, from seventy-five cents to one dollar. The price of corn must depend upon the quantity produced, not only here but further north, for I am sorry to say, we are frequently under the necessity of purchasing from abroad. During the time that cotton sold at high prices, our planters paid but little attention to the provision crop, because they could easily give a dollar per bushel for corn, and yet find it to their advantage to cultivate cotton. But with them, (with few exceptions,) this cotton age is passed, and it is a desideratum with most that provisions, (at least for the use of the plantation,) should be produced. It was with this spirit our Society were induced to offer these premiums; I conceive they have gained nothing more by it than a knowledge of how much can be raised to one acre. The common product of our island one year with another, is from five to thirty bushels of corn to the acre; but twenty bushels to the acre is considered a very good crop. When I make this difference in the product per acre, I mean different qualities of land. It would of course follow that it would be of more advantage to the planter to learn how to make his whole field produce twenty or thirty bushels per acre, than to have one acre produce seventy-five bushels, and the rest only five or ten.

Since I am writing, I will mention a circumstance which had somewhat escaped my memory until looking over the minutes of the Society, I beheld it there recorded. In the month of June, 1828, one of the members of the Society brought to the meeting a cotton stalk in full blossom. This stalk, among a number of others, he had cut from

the field and stuck down in a bed of peas. They had all taken root and were at that time in full bearing of leaves and blossoms. I left the island immediately afterwards, and did not return for several months, and have never been able to learn whether the fruit came to perfection. The winter previous was so mild that the cotton with us was killed in but few places; but I was not before aware that a cutting from the cotton stalk would take root in this manner, and this one was at least five feet in length.

I am, with much respect, your obd't. serv't.

CHARLES W. CAPERS.

ART. XIII.—*On the Culture of the Grape Vine; by* GEORGE WILSON.

"Newbern, (N. C.) October 1, 1832.

Dear Sir,—Your letter requesting information relative to the culture of the vine is received, and I should have answered it at an earlier period, but have been prevented by business.

My knowledge on the subject is very limited, but I will endeavour to impart to you what I may know about it.

I commenced the culture of the vine about five year's since, in a small way, having planted about four acres with it. My vineyard consists of a variety of grapes; some of them of native and some of foreign sorts; planted in a sandy soil, of tolerable fertility, about one mile north of a navigable river—the Trent. The land from the vineyard to the river is cleared of its timber. About three year's since, I procured from Mons. Labat, of Long-Island, fifty-eight varieties of foreign, (principally French) grape vines, and planted them in my vineyard amongst the native ones. They all had roots. Thus far they have invariably done badly. Three or four of them have

this season, produced a few bunches of grapes. They put out their foliage early in the spring; so early that they are almost always nipped by the frost; grow tolerably thrifty until August, when the heat of the sun overpowers them, and their leaves become crisped, and fall off. A new supply from the buds then comes forth, which remains until frost. The consequence is, that an exhaustion of the vital powers of the plant is induced, and a decay is the result thereof: the plant dwindles and is killed to the root by the cold of the winter months. The succeeding spring it shoots again, pursues the same changes and at winter again shares the same fate. None of the fifty-eight vines, with the exception of three or four of them, have grown large enough to produce fruit, and these three or four are very diminutive, and unthrifty. They seem to have a tendency to be always in advance of the season. They bud very early, run their course of leafing by August, and then drop them, and then bud and leaf again, to be dropped at the approach of our fall frosts. They seem to have no tendency to acclimate. I deem them perfectly unsuited to our climate.

On the contrary, the native vines in the same vineyard flourish most vigorously, and bear fruit abundantly.

My plan of rearing them is to suffer the trunk of the vine to grow six or seven feet high without a limb, and place a scaffold upon posts at that height from the earth, for its top branches to run and spread upon, and prune sparingly. Some of my vines cover an area of sixty feet square—their trunks being in the centre of it. They are placed thirty feet apart in every direction. Until they grow large enough to cover the earth, the land is tilled in some crops that require the plough and hoe.

From the product of a single vine of the Scuppernong variety, in my vineyard, sixty gallons of wine were made. An acre will sustain twenty of them of equal size, and yield one thousand gallons of wine.

We have many varieties of the Scuppernong, besides many kinds of other native grapes.

My vines generally are young, and produce but few grapes, so that I have made but little wine, and have no great skill in its fabrication. I have made some that is good—from the Scuppernong and the "Arena"—not

having enough of the other varieties to induce an experiment.

So soon as my present crop of rice is saved, I will answer your other inquiry relative to that article.

GEORGE WILSON.

ART. XIV.—*Observations on the Rot of the Grape—directions for tanning Buckskins, (in reply to Paul Pry) and Notices of the Bee-house; by* JAMES JONES.

"Paris Henry County, (Ten.) October. 6, 1832.

Dear Sir,—* * * * The cause of the rot in grapes, in my opinion, is from the redundency of sap in the vine, any one may rot his grapes in fifteen days, by putting manure upon the root of the vine; now, Sir, if they will permit the vines to run upon arbours, and prune but very little, grapes may be raised in abundance. I know a vine in this neighbourhood of which the grapes never rot from not pruning at all. I permitted one of mine to grow and ceased pruning it, the consequence was, that it bore grapes plentifully, and I never saw a rotten one on it twelve months after I ceased to prune, while others near it continued to loose their grapes; some of the bunches lay on the ground and remained sound and good, though they continued to decrease in size a little. My neighbour had a vine upon which he had some well rotted manure thrown, when the grapes were full grown, they began to rot; he mentioned it to me and I advised the raking of the ground from the roots, about eight feet around, until they were exposed, it was done, and the grapes ceased to rot and ripened, though the same vine had the year before that lost its grapes. It is a well-known fact that any fruit tree, that casts its fruit, while green, may be brought to bear, by taking the rich earth from the roots and filling the place with poor sand, why may not this succeed with the vine. Any tree that blossoms may be made fruitful in that way, take off

the rich earth from the roots, say about six inches deep and say about eight or ten from the tree, and fill up with sand.

In answer to "Paul Pry," page 253, vol. v. how to dress deer skins. Select the blue or red skins, (as they are best) soak them in common spring or river water, twenty-four hours if warm weather, if cold, longer—flesh them (in the way that tanners flesh hides,) put them into strong soap-suds for twelve hours, then they are ready for graining, which may be done with the back of a drawing knife, ground exactly at right-angles, so as to make a good corner on each side; (a sharp instrument will cut the hide) after they are grained, rub them over a plank or board until dry; (drive the board into the ground and round the top a little to rub them on); put them into brain water, (made by putting any kind of brains into water and mixing them well) when they are brained enough, water can be pressed through them; wring them as dry as possible, and rub them until dry; if not as soft as wished, put them into brain water again, and rub until dry as before. Smoking only gives colour and is a difficult matter, the skins are apt to get injured, it is done by putting the skins over a scaffold or hogshead, and smoked without a blaze and with bark. Buff ball, made of yellow ochre ground in oil, very fine sand and chalk to give the colour desired, mixed together so as to form a ball, will give the desired colour, though I do not know the proportions of each; the ochre and chalk are mixed so as to give the colour desired in the same way that putty is made, the sand is put in for the purpose of buffing or rubbing up the grain, so as to make it stick; it is used when dry. They may be dyed any colour by putting on the dye lightly with a brush, and repeating often so as not to suffer the dye to pass through the skin; when nearly dry rub till dry: after they are buffed, brush off the loose particles.

I have seen a bee-house about eight by six feet, weather boarded, it did not answer, the bees did not swarm, but all died in the winter, probably from its being too thin to protect them from cold.

Yours, &c.

JAMES JONES.

ART. XV.—*On the Culture of Rhubarb; by the* EDITOR.

Read before the Horticultural Society of Charleston, October 16th, 1832.

(Concluded from page 14.)

Although it is probable that several years will elapse before this plant will be in common use among us, yet it may not be amiss to give some directions for forcing it, for when it is known with what ease it may be grown, and our community have been made acquainted with its good qualities, we doubt not but that many will desire to have it at other than the regular seasons, especially as it can be obtained with very trifling expense of time or labour throughout the whole winter.

The following extract, (taken from the Encyclopædia of Gardening) is from the pen of T. A. Knight, Esq. and gives not only his mode of forcing, but also the rationale of the process.

"The root of every perennial herbaceous plant contains within itself, during winter, all the organisable matter, which it expends in the spring in the formation of its first foliage and flower stems; and it requires neither food nor light to enable it to protrude these, but simply heat and water: and if the roots be removed entire, as soon as its leaves become lifeless, it will be found to vegetate, after being replanted, as strongly as it would have done, if it had retained its first position. These circumstances led me, in the last winter, to dig up the roots of many plants of the common rhubarb (which I had raised from cuttings in the preceding spring,) and to place them in a few large and deep pots, each pot being made to receive as many as it would contain. Some fine sandy loam was then washed in, to fill entirely the interstices between the roots, the tops of which were so placed as to be level with each other, and about an inch below the surface of the mould in the pots, which were covered with other pots of the same size, inverted upon them: being then placed in a vinery (in a situation where nothing else could be made to thrive on account of want of light,) and being copiously applied with water, the plants vegetated rapidly and strongly, and from each pot I obtained three successive crops, the leaf-stalks of the two first being crowded so closely as nearly to touch each other over the whole surface of the pots. As soon as the third crop of leaves was broken off, and a change of roots became necessary, those taken from the pots were planted in the open ground, their tops being covered about an inch deep with mould, and I have reason to believe, from present appearances, that they will live and recover strength, if given a year of rest to

be fit for forcing again. Should they, however, perish, it is of very little consequence; as year-old roots, raised from cuttings or even from seeds, sown in autumn in rich soil, will be found sufficiently strong for use. The heat of a hot-bed, a kitchen, or other room, and, on the approach of spring (probably at any period after the middle of January,) a cellar, will afford a sufficiently high temperature; and the advantage in all cases will be that of obtaining from one foot of surface as much produce as in the natural state of growth of the plants would occupy twenty feet; and in the shady space of the vinery or peach-house, not applicable to other purposes, and without incurring any additional expense in fuel, or doing injury to the soil, a succession of abundant crops may be raised."

In the garden of the London Horticultural Society, the following process is followed:—

"The seed is sown in rich soil the beginning of April. The plants are allowed sufficient room to attain a considerable size during the summer, and in autumn, when they have began to leave off growing, they are taken up and potted in pots not much larger than what are sufficient to hold the roots, and two, three, or more, put in a pot according to its size. They are then placed in a shady situation, till they are removed to the forcing house. This is, perhaps, as easy a mode of growing and forcing rhubarb as in any practice. A great advantage of raising the plants from seed is, that the roots being more like those of carrots than the roots of plants obtained by division, several of them can be got into one pot; the buds are also stronger."

It is not, however, necessary to place them either in vineries, hot-houses, or hot-beds, the little heat required to force them is obtained readily by other means. Perhaps the most simple plan, and at the same time, equally as good as most others, is to take up the plants and pack them (as stated above) in boxes. These boxes to be placed in succession in rooms having a temperature of from 55 to 60 degrees, which is amply sufficient. The kitchen, perhaps, will be found the most eligible place. If taken up in December, the leaves will be fit for use in February, and a box brought in every three weeks will afford a regular supply. When the forcing is over, the roots should be kept "under cover of long litter or manure" until March, when they may be divided by a sharp knife, (taking care to preserve a bud to each piece) and planted out in a shady situation. The strongest of these

roots will be fit to force again the ensuing winter, but the weaker plants should be left for another season.

Some, however, may not be willing to take up their plants, fearing that they might be lost by this treatment. There does not appear to be much danger of this, yet it is as well, to know, that they may be forced, with very little trouble, and without disturbing the roots. The mode of procedure is simply to cover the roots where they grow with boxes, half barrels, or any hollow vessel which are large enough, and pile fresh manure around, the heat from which will soon cause the plants to vegetate vigorously. Three crops of leaves may be thus obtained, after which they should be left alone, to recover and be protected from the influence of cold weather, which might otherwise seriously injure them. A succession may be obtained by placing the covering and manure in succession over the plants. Other modes are mentioned in various works which we have by us, but these being the most simple, and at the same time as efficacious, the time of the Society will not be taken up with an account of them.

The information we have given will be amply sufficicient, we hope, to enable any one desirous of cultivating the Rhubarb, to proceed. This plant is well worthy of a place in every garden. It not only affords a delightful addition to our dessert, but it possesses the advantage of coming into use at a time when nothing else can be procured, and being moreover peculiarlly wholesome, a property possessed by none of the green fruits usually employed for that purpose. The medicinal qualities which it possesses, even when made up into tarts or conserves, ought of itself, to recommend it to a very favourable notice. In the *Southern Agriculturist*,* will be found a letter from the Editor of the *American Farmer*, stating that he had cured an infant daughter of the *cholera infantum*, when little or no hopes were entertained of her recovery, merely by giving her occasionally a small piece of Rhubarb tart. At page 558, of the same volume, is a further notice, by the same gentleman, of the excellence of Rhubarb tarts and conserves as a cure for cases of common diarrhea. In this he states, "that all subsequent trials of the Rhubarb in diarrhea either in children or adults,

* Vol. iii. p.

have proved wonderfully efficacious. During the present summer our children have had frequent attacks of summer complaints, and we have applied the usual remedies with very little effect. In each instance we have been obliged to resort to the Rhubarb at last. We have ventured to make these trials of the usual remedies, the more effectually to put both them and the Rhubarb to a fair test, and feel authorised by numerous instances of its success, and by the absence of a single failure, to say that the Rhubarb conserve is unequalled as a remedy for common bowel complaints in children and adults. A tea spoonful of the conserve spread on a piece of dry bread, is the best mode of administering it, and of this, children are very fond."

It is not, however, owing to its medicinal qualities that it is now in such great request, but (as we have several times had occasion to remark) its delightful flavour and peculiar earliness, has made it a favourite wherever known. Of the great demand which exists in London for the leaves of this plant some idea may be formed from the following extract taken from the report of the Covent Garden Market for June, 1832. "Rhubarb which has for some years past been largely cultivated, is still a subject of increasing interest, and more extensively in demand than ever: on the 5th of May, no less than eight entire wagon loads packed in bulk, with an equal quantity in smaller proportions were brought in and sold in this market alone: one cultivator, Mr. Myatt, of New Cross, Deptford, had three wagon loads, he has, I believe, nearly twenty acres in culture." From this extract it will be seen that a quantity equal to sixteen wagon loads were brought in and sold in one day, and in one market alone.

In conclusion, we cannot refrain from recommending its introduction and culture on every plantation. Its earliness will insure a supply for dessert from March to June from the open ground, and if it be raised in the manner pointed out, it may be forced so as to have it all times throughout the winter, commencing as early as the planter returns to his plantation.

Note.—Since reading the above before the Horticultural Society, we have taken up the plants raised last summer and the one previous, for the purpose of removing them. We found

that all grown in the low ground, had not formed a spindle shaped root like the carrot, which we believe is always the case when grown on light soil, but had spread and divided into several smaller roots. One of the plants two years old measured five inches in diameter across the crown. Several of those raised last summer measured from two to two and a half inches diameter. We know not to what size they grow in cooler climates during the first and second years, but judging from such as we have seen sent out to this place, we are inclined to believe that these will bear a comparison with them. They are decidedly larger than any we have seen from the North, and sufficiently so to warrant the belief that Rhubarb may be successfully cultivated in the Southern States.

January 22, 1833.

ART. XVI.—*Further Remarks on the "Life of Eli Whitney;" by* A SMALL PLANTER.

"St. Matthew's Parish, October 27, 1832.

Dear Sir,—About a week since I took the liberty of forwarding a letter to you, containing a hasty imperfect sketch of an excursion I made into Georgia in the year 1797, and an incomplete, though true account of the invention of the saw-gin, to which the following is intended as a supplement.

I had frequently understood that the cotton staple had been so much injured by both of these gins (the wire teeth and saw) as to render it much more difficult to spin and less lasting when manufactured into cloth than that which had been ginned by rollers, and consequently could never be used to any advantage by the long staple cotton planters, and it was obvious that a still further improvement was necessary. But it occured to me that the injury sustained by the staple, was not so much owing to the keen harshness of the teeth, as to their impetuous violence and inflexibility; and that could a set of pliable elastic pickers be invented, of the nature of card teeth, the staple might be extracted from the seed as expediciously as by annular

saws, and as uninjured as that done by rollers. I endeavoured to communicate this idea to several of my intelligent acquaintances in Georgia, but none seemed to comprehend or approve of it, either there or here till the year 1803.

I became acquainted with an English mechanist, who then resided in Newberry district, and had become a valuable acquisition to the vicinity by manufacturing manual spinning and carding machines, which facilitated labour, and greatly encouraged the industry of the neighourhood. I have have found the very man I wanted to find, (thought I to myself) nor was I disappointed. I visited his shop—he exhibited to me all the machines that he had brought with him from England, such, he said, as had never previously been seen in America; that could cut, bend and manufacture card teeth of all sizes and dimensions. He had never seen a saw-gin: I took him to see one; he acceded to my opinion and caught my idea of its improvement instantly, assuring me that he could make a machine to gin cotton by substituting card teeth in the place of the annular saws, that would do as much business in a given time as the saw-gin of equal dimensions, and that to, without injuring the staple in the least; and as soon as his present engagement was complied with, he would make one to go by hand, which would also serve as a model. But before he could accomplish this he was called away to attend to an estate which had devolved to him in England by the death of a rich relation to whom he was sole heir and after his return he abandoned his trade. Yet he did not forget his promise, but made the card-tooth picking machine, as he informed me afterwards, which answered precisely the intended purpose, that he would have sent it to me had he known where I lived; and that on his removal from Newberry he had made a present of it to one of his old neighbours.

His manner of making it he described as follows—he took a piece of firm well tanned, well dressed kid skin, as long and as wide as the length and circumference of the cylinder to which it had to be affixed, and had as many rows of coarse wire card-teeth pierced through it as there were vacancies between the ribs—said teeth were of a sufficient length to extend as far through the ribs as what

the saws do—he then nailed said piece round the cylinder so as to make the rows of teeth annular, and to ply between the ribs like the annular saws; by this method he assures me he ginned cotton by hand without injuring the staple in the least, and the spinners that spun what was ginned, said it was equal to that which was picked by the fingers. This, Sir, I give you on the credit of the said machinest, and had I not known him to be a man of sincerity and the strictest veracity, I should never put it on paper.

You are welcome to do as you please with this piece, provided you will erase out every word that meets not with your approbation.

Success to your useful journal and laudible zeal, is the sincere wish of

Your humble servant,

A SMALL PLANTER.

ART. XVII.—*Account and Description of the Upper Districts of South-Carolina; by* A. CAROLINIAN.

Mr. Editor,—The last summer having some idle time upon my hands, I determined to remedy the defect of practical information, relative to the resources of the interior of my own State, and take a tour of it generally, any representation which I could give of the middle and lower country would be superfluous and unnecessary, as most, if not all of your subscribers are personally acquainted with the same, I shall, therefore, confine myself to a description of the back country, and from it deduce the fact, that we have within our own limits advantages and resources which we seek at the north and elsewhere, health and scenery, and that patronage is all that is wanted to add amusement to the list.

The climate of Pendleton and Greenville districts is the most elastic and bracing that I ever inhaled, there is a purity which seems to act as a gentle stimulant as you

breathe it, not at all acrid or cutting to the lungs, but on the contrary, soothing and pregnant, with wholesome tendency. I had an opportunity of witnessing several instances of its salutary and restorative influence in pulmonary cases, one in particular, of which I had met in Charleston, in the spring previous. He was emaciated, the colour of a naturally florid cheek had exchanged itself for the sickly hue of a cadaverous white; his flesh had gradually left an athletic frame, and a robust person presented, but the lank and wasted skeleton. He had been in Pendleton about five months, and when I met him at a large dinner party, with unaffected surprise, I hesitated a look of recognition; "Richard was himself again," and he quaffed his wine as cherily as the best of us.

Another was the case of an only daughter, who with her mother had tried all the variety of climate and water from Maine to Georgia, who had denied no expense or pains to restore her to her former self; the best advice, the choicest luxuries, the most "careful care," all the varieties of certain specifics; panaceas and anti-panaceas, pills and powders, were resorted to in vain, she gradually drooped like a flower, whose stem was sapped by some insinuating insect. As a last resort when hope was lost in the failure of restoration by other *(reputed)* more salubrious climes, and nought was left to a doating mother's heart, save the blighting certainty of losing her little all, as a forlorn hope the air of the Blue Ridge and Buncomb was proposed; the first summer seemed to act as water to a plant that had nearly perished through the lack of moisture. The second and third have added their due proportion, and this *once* lovely being is now (by reason of the remembrance of her former melancholy situation) more lovely still.

I could relate several other instances, which came under my observation during this one season, but I presume that the above are sufficient to establish the point of our possessing as wholesome and restorative an atmosphere as our neighbours of Saratoga, the Catskill and Allegany. In point of temperature there can he none more grateful to him who absents himself from the low country on that score. The soil is far superior to any thing that our northern brethren can boast of, is rich and mellow, and highly productive to him who possesses industry to till

it, indeed, there is little labour, in comparison with what we are compelled to exercise, necessary to bring you a good crop.

How much pleasanter would it be for those of our planters and others who are compelled to leave their plantations in the summer season, instead of spending the earnings of their winter labour in northern cities, either to hire or purchase a small farm, (which may be had at a low rate) and make it the source of his support and amusement, thereby benefiting his native State and economizing his patrimony, or should he wish to be idle, and indulge in relaxation from the turmoil of a busy life, Greenville presents him a delightful resort, a village which may vie with any of its tribe to advantage, indeed, the romantic nature of its site can scarcely be surpassed—surrounded by groves of oak and chesnut—sited upon a rock which runs under at a depth of two or three feet, taking its boundary from a small river, (Reedy) which serpentines through groves of trees, and pursuing its course over a bed of rock, and then falls from a height of fifteen or twenty feet in two or three distinct cataracts, until it reaches its bed, and is seen winding its course through the foliage and shrubbery with a calm and quiet surface, forming a strikingly beautiful contrast with its recent roar and boiling foam as it rushed down the rocky precipice, seeking to hide itself in the recesses formed by the broken fragments of granite beneath. A few miles distant are seen Paris and Piny mountains, miniatures of the Saluda and Blue Ridge, which hang in the distance like dense clouds, or rather seeming as an azure curtain suspended from the heavens between the sister States. At the water-fall, at the foot of the main street of the village, a large mill is sited upon the edge of the precipice, so as to receive an impetus from the force of the water in its descent, and by this means, its wheel is constantly adding its noisy tribute to the constant roar of the cataract.

The society during the summer months is unobjectionable, and, on the contrary, of the most fascinating order, consisting of travellers from all the Southern States, wending their way north and south, east and west, some on business, others in search of pleasure. No sooner than one party leaves another supplies its place. Balls and

parties are frequent, and all rational amusement within reach.

Knowing the limited character of your work, I will postpone further observations on the subject for another number, should you think these worthy of a place in your present. The yankees have a way of writing and engraving their country into notice, and thereby of making it the the resort of all who have money to spend. However, I will say more of that in my next.

Respectfully,

A CAROLINIAN.

PART II.

SELECTIONS.

Art. XI.—*The General Management of the Horse.*

[FROM THE LIBRARY OF USEFUL KNOWLEDGE.]

Food.—The system of manger-feeding is becoming general among farmers. There are few horses that do not habitually waste a portion of their hay; and by some the greater part is pulled down and trampled under foot, in order first to cull the sweetest and best locks, and which could not be done while the hay was inclosed in the rack. A good feeder will afterwards pick up much of that which was thrown down; but some of it must be soiled and rendered disgusting, and, in many cases, one-third of this division of their food is wasted. Some of the oats and beans are imperfectly chewed by all horses, and scarcely at all by hungry and greedy ones. The appearance of the dung will sufficiently evince this.

The observation of this induced the adoption of manger-feeding, or of mixing a portion of chaff with the corn and beans. By this means the animal is compelled to chew his food; he cannot, to any degree, bolt the straw or hay; and while he is forced to grind that down, the oats and beans are ground with it, and yields more nourishment; the stomach is more slowly filled, and therefore acts better on its contents, and is not so likely to be overloaded; and the increased quantity of saliva thrown out in the lengthened grinding of the food, softens it, and renders it more fit for digestion.

If, when considerable provender was wasted, the horse maintained his condition, and was able to do his work, it was evident that much might be saved to the farmer, when he adopted a system by which the horse ate all that was set before him; and by degrees it was found out that even food somewhat less nutritious, but a great deal cheaper, and which the horse either would not eat, or would not properly grind down, in its natural state, might be added, while the animal would be in quite as good plight, and always ready for work.

Chaff may be composed of equal quantities of clover or meadow hay, and wheaten, oaten, or barley straw, cut into pieces of

a quarter or half an inch in length, and mingled well together; the allowance oats and beans are afterwards added, and mixed with the chaff. Many farmers very properly bruise the oats or beans. The whole oat is apt to slip out of the chaff and be lost; but when it is bruised, and especially if the chaff is a little wetted, it will not readily separate; or, should a portion of it escape the grinders, it will be partly prepared for digestion by the act of bruising. The prejudice against bruising the oats is, so far as the farmer's horse, and the wagon horse, and every horse of slow draught is concerned, altogether unfounded. The quantity of straw in the chaff will always counteract any supposed purgative quality in the bruised oats. Horses of quicker draught, except they are naturally disposed to scour, will thrive better with bruised than with whole oats; for a greater quantity of nutriment will be extracted from the food, and it will always be easy to apportion the quantity of straw or beans to the effect of the mixture on the bowels of the horse. The principal alteration that should be made in the horse of harder and more rapid work, such as the post-horse, and the stage-coach horse, is to increase the quantity of hay and diminish that of straw. Two trusses of hay may be cut with one of straw.

Some gentlemen, in defiance of the prejudice and opposition of the coachman or the groom, have introduced this mode of feeding into the stables of their carriage horses and hackneys, and with manifest advantage. There has been no loss of condition or power, and considerable saving of provender. This system is not, however, calculated for the hunter or the race horse. Their food must be in smaller bulk, in order that the action of the lungs may not be impeded by the distention of the stomach; yet many hunters have gone well over the field, who have been manger-fed, the proportion of corn, however, being materially increased.

For the agricultural and cart-horse, eight pounds of oats and two of beans should be added to every twenty pounds of chaff; and thirty-four or thirty-six pounds of the mixture will be sufficient for any moderate sized horse, with fair, or even hard work. The dray and wagon-horse may require forty pounds. Hay in the rack at night is, in this case, supposed to be omitted altogether. The rack, however, may remain, as occasionally useful for the sick horse, or to contain tares or other green meat.

In order to prevent some horses from turning much of the chaff out of the manger in their search for the oats, small iron bars may be placed across it, and the provender plentifully sprinkled with water, but the water should be applied only at the time of feeding, for the wetted mixture would soon become sour and mouldy.

Horses are very fond of this provender. The majority of them, after having been accustomed to it, will leave the best oats

given to them alone, for the sake of the mingled chaff and corn. We would, however, caution the farmer not to set apart too much damaged hay for the manufacture of the chaff. The horse may be thus induced to eat that which he would otherwise refuse; but if the nourishing property of the hay has been impaired, or it has acquired an injurious principle, the horse will either lose condition, or become diseased. More injury is done by the eating of damaged hay or musty oats than is generally imagined. There will be sufficient saving in the diminished cost of the provender by the introduction of the straw, and in the improved condition of the horse, without poisoning him with the refuse of the farm.

While the mixture of chaff with the corn prevents the corn from being too rapidly devoured, and a portion of it swallowed whole, and therefore the stomach is not too loaded with that on which, as containing the most nutriment, its chief digestive power should be exerted, yet, on the whole, a great deal of time is gained by this mode of feeding, and more is left for rest. When a horse comes in wearied at the close of the day, it occupies, after he has eaten his corn, two or three hours to clear his rack. On the system of manger-feeding, the chaff being already cut into small pieces, and the beans and oats bruised, he is able fully to satisfy his appetite in an hour and a half. Two additional hours are therefore devoted to rest. This is a circumstance deserving of much consideration even in the farmer's stable, and of immense consequence to the postmaster, the stage-coach proprietor, and the owner of every hard-worked horse.

Manger food will be the usual support of the farmer's horse during the winter, and while at constant or occasional hard-work; but from the middle or end of April to the end of July, he may be fed with this mixture in the day, and turned out at night, or he may remain out during every rest day; a team in constant employ should not, however, be suffered to be out at night, after the end of July.

The farmer should take care that the pasture is thick and good; and that the distance from the yard is not too great, nor the fields too large, otherwise a very considerable portion of time will be occupied in catching the horses in the morning. He will likewise have to take into consideration the sale he would have for his hay, and the necessity for sweet and untrodden pasture for his cattle. On the whole, however, turning out in this way, when circumstances will admit of it, will be found to be more beneficial for the horse, and cheaper than soiling in the yard.

The small farmer's horse is sometimes fed on hay or grass alone, and the animal, although he rarely gets a feed of corn, maintains himself in tolerable condition, and does the work that is required of him; but hay and grass alone, however good in quality, or in whatever quantity administered, will not support

the horse under hard work; and therefore other substances, containing a larger proportion of nutriment in a smaller compass, have been added. We will briefly enumerate them, and consider their comparative value. In almost every part of Great Britain, the oat has been selected as that portion of the food which is to afford the principal nourishment. It contains seven hundred and forty-three parts out of a thousand of nutritive matter. The oat should be old, heavy, dry, and sweet. The new oat will weigh ten or fifteen per cent. more than the old oat: but the difference consists principally in watery matter, which is gradually evaporated. The new oat is not so readily ground down by the teeth as the old one, and forms a more glutinous mass, difficult to digest, and, when eaten in considerable quantities, is apt to occasion colic and even staggers. The old oat forms, when chewed, a smooth and uniform mass, which readily dissolves in the stomach, and yields the nourishment which it contains, and perhaps some chemical change may have been slowly effected in the old oat, disposing it to be more readily assimilated. Oats should be plump, bright in colour, and free from unpleasant smell or taste. The musty smell of wetted or damaged corn is caused by a fungus which grows upon the seed, and which has an injurious effect upon the urinary organs, and often on the intestines, producing profuse staling, inflammation of the kidney or colic, and inflammation of the bowels.

This musty smell is removed by kiln-drying the oat, but care is here requisite that too great a degree of heat is not employed. It should be sufficient to destroy the fungus without injuring the life of the seed. The kiln-burnt oat, however, is not so grateful to the animal: it acquires a heating quality—causes increased discharge of urine, and not unfrequently produces inflammation of the eyes and mangy affections of the skin.

Of the quantity of oats in the chaff we have already spoken. An improvement would be effected, by cutting the unthreshed oat straw into chaff. The expense of threshing would be saved. Oat-straw is better than barley-straw, but does not contain so much nourishment as that of wheat.

When the horse is fed on hay and oats, the quantity of the oats must vary with his size and the work to be performed. In winter, four feeds, or nine or ten pounds of oats a day, will be a fair allowance for a horse of fifteen hands one or two inches high, and that has moderate work. In summer, half the quantity, with green food, will be sufficient.

Oatmeal will form a poultice, more stimulating than one composed of linseed meal alone—or they may be mingled in different proportions as circumstances may require. In the form of gruel it constitutes one of the most important articles of diet for the sick horse—not indeed forced upon him, but a pail containing it

being slung in his box, and of which he will soon begin to drink when water is denied. In cases of poisoning, or of over purging, it is useful, whether administered by the mouth, or as an injection.

White-water, made by stirring a pint of oatmeal into a pail of water, the chill being taken from it, is an excellent beverage for the thirsty and tired horse.

Barley is a common food of the horse on the continent, and, until the introduction of the oat, seems to have constituted almost his only food. It is more nutritious than oats, containing nine hundred and twenty parts of nutritive matter in every thousand. There seems, however, to be something necessary besides a great proportion of nutritive matter, in order to render any substance wholesome, strengthening, or fattening. Except where horses are very hardly worked, barley does not seem in our country to agree with them so well as oats. They are more subject to inflammatory complaints, and particularly to surfeit and mange. When barley is given, the quantity should not exceed a peck daily. It should be always bruised, and the chaff should consist of equal quantities of hay and barley-straw, and not cut too short. If the farmer has a quantity of spotted or unsaleable barley which he wishes thus to get rid of, he must very gradually accustom his horses to it, or he will probably produce serious illness among them. For horses that are recovering from illness, barley, in the form of malt, is often serviceable, as tempting the appetite and recruiting the strength. It is best given in mashes; water, considerably below the boiling heat, being poured upon it, and the vessel or pail kept covered for half an hour.

Grains fresh from the mash-tub, either alone, or mixed with oats or chaff, or both, may be occasionally given to horses of slow work; they would, however, afford very insufficient nourishment for horses of quicker or harder work.

Wheat is in Great Britain more rarely given than barley. It contains nine hundred and fifty-five parts of nutritive matter. When farmers have a damaged or unmarketable sample of wheat, they sometimes give it to their horses, and, being at first used in small quantities, the horse becomes accustomed to it, and thrives and works well. It must, however, always be bruised and given in chaff. Wheat contains a greater proportion of *gluten*, or sticky, adhesive matter, than any other kind of grain; it is difficult of digestion, and apt to cake and form obstructions in the bowels. This will oftener be the case if the horse is suffered to drink much water soon after feeding upon wheat; for the water passing rapidly through the stomach and small intestines, in its way to the cœcum, carries off with it all the starch, which is the most nourishing, and leaves this sticky mass behind, which accumulates and hardens, and obstructs the intestines, and often destroys the horse. A horse that is fed on wheat

should have very little hay. The proportion should not be more than one truss of hay to two of straw. Wheaten flower boiled in water to the thickness of starch, is given with good effect in over purging, and especially if combined with chalk and opium.

Beans.—These form a striking illustration of the principle, that the nourishing or strengthening effects of the different articles of food depend more upon some peculiar property which they have, or some combination which they form, than on the actual quantity of nutritive matter. Beans contain but five hundred and seventy parts of nutritive matter, yet they add materially to the vigour of the horse. There are many horses that will not stand hard work without beans being mingled with their food, and these not horses whose tendency to purge it may be necessary to restrain by the astringency of the bean. There is no traveller who is not aware of the difference in the spirit and continuance of his horse if he allows or denies him beans on his journey. They afford not merely a temporary stimulus, but they may be daily used without losing their power, or producing exhaustion. Two pounds of beans may, with advantage, be mixed with the chaff of the agricultural horse, during the winter. In summer, the quantity may be lessened, or the beans altogether discontinued. Beans are generally given whole. This is very absurd; for the young horse, whose teeth are strong, seldom requires them; while the old horse, to whom they are in a manner necessary, is scarcely able to masticate them, swallows many of them whole which he is unable to break, and drops much corn from his mouth in the ineffectual attempt to break them. Beans should not be merely split, but crushed; they will, even then, give sufficient employment to the grinders of the animal. Some postmasters use chaff with beans instead of oats. With hardly-worked horses they may possibly be allowed; but in general cases, the beans, without oats, would be too binding and stimulating, and would produce costiveness, and probably megrims or staggers.

Peas are occasionally given. They appear to be in a slight degree more nourishing than beans, and not so heating. They contain five hundred and seventy-four parts of nutritive matter. For horses of slow work they may be used; but the quantity of chaff should be increased and a few oats added. They have not been found to answer with horses of quick draught. It is essential that they should be crushed; otherwise on account of their globular form, they are apt to escape from the teeth, and many are swallowed whole. Exposed to warmth and moisture in the stomach, they swell very much, and may painfully and injuriously distend it.

Many horses have died after gorging themselves with peas, and the stomach has been found to have been burst by their swelling. If a small phial is filled with peas, and warm water

poured on them, and the bottle tightly corked, it will burst in a few hours.

Herbage, green and dry, constitutes a principal part of the food of the horse. There are few things with regard to which the farmer is so careless as the mixture of grasses on both his upland and meadow pasture. Hence we find, in the same field, the ray grass, coming to perfection only in a loamy soil, not fit to cut until the middle or latter part of July, and yielding little aftermath; the meadow fox-tail, best cultivated in a clayey soil, fit for the scythe in the beginning of June, and yielding a plentiful aftermath; the glaucous fescue grass, ready at the middle of June, and rapidly deteriorating in value as its seeds ripen; and the fertile meadow grass, increasing in value until the end of July. These are circumstances, the importance of which will, at no distant period, be recognized. In the mean time, Sinclair's account of the different grasses, or the condensation of the most important part of his work in Sir Humphrey Davy's Agricultural Chemistry, are well deserving of the diligent perusal of the farmer.

Were there not too many proofs that the very refuse of the farm is often devoted to the keep of the agricultural horse, it would be needless to repeat that the animal that works constantly and hard should have the best food, and plenty of it. Old hay, as having longer undergone that slow process of fermentation, by which the sugar that it contains is developed, is far more nutritive and wholesome than new hay. *Mow-burnt* hay is more injurious to horses than to any other of the domestic animals, and is a fruitful source of disease.

Where the manger system of feeding is not adopted, or where hay is still given at night, and chaff and corn in the day, there is no error into which the farmer is so apt to fall as to give an undue quantity of hay, and that generally of the worst kind. If the manger system is good, there can be no necessity for hay, or only for a small quantity of it; but if the rack is overloaded, the greedy horse will be eating all night instead of taking his rest; and when the time for the morning feed arrives, his stomach will be already filled, and he will be less capable of work, from the want of sleep, and from the long-continued distention of the stomach rendering it impossible for the food to be properly digested.

It is a good practice to sprinkle the hay with water in which salt has been dissolved. It is evidently more palatable to the animal, who will leave the best unsalted hay for that of an inferior quality moistened with brine; and there can be no doubt that the salt very materially assists the process of digestion. The preferable way of salting the hay would be to sprinkle it over the different layers as the rick is formed. From its attraction for water, it would combine with that excess of moisture

which, in wet seasons, is the cause of too rapid and violent fermentation, and of the hay becoming mow-burnt, or the rick sometimes catching fire, and it would become more incorporated with the hay. The only objection to its being thus used is, that the colour of the hay is not so bright; but this would be of little consequence for home consumption.

Of the value of tares, as forming a portion of the late spring and summer food of the stabled and agricultural horse, there can be no doubt. They are very nutritive, and they act as a kind of medicine. When surfeit-lumps appear on the skin, and the horse begins to rub himself against the divisions of the stall, and the legs swell, and the heels threaten to crack, a few tares cut up with the chaff, or given instead of a portion of the hay, will often afford immediate and perfect relief. Ten or twelve pounds may be given daily, and half that weight of hay substracted. It is an erroneous notion, that, given in moderate quantities, they either roughen the coat or lessen the capability for hard work.

(To be continued.)

Art. XII.—*Adapting Plants to Soils.*

[from the new-england farmer.]

The following valuable remarks, from the pen of Mrs. Agnes Ibbetson, a lady celebrated for her agricultural economical skill, are extracted from the Bath and West of England Society's papers.

I have been lately much employed in endeavouring to show that all plants should be divided, disposed or placed according to the different soils, congenial to their habits, from which they originally proceed; and that it is to the total inattention to this circumstance, that we probably owe the very strange and contradictory results constantly to be found in all agricultural reports. No person can read with attention the late accounts delivered to the House of Commons, respecting the growth of corn throughout this kingdom, without being struck with the contradictory returns transmitted of the whole; and without being convinced that there must be some hidden cause for such a strange diversity in the gains of the *farmer:* as there are many instances adduced in those reports, of the same excellent management, where the same seed has been sown, an equal degree of labour performed, with the same *season, time and manure* employed, and one farmer has gained three times as much again

as was expended for putting in the crop, while another has scarcely exornerated and repaid himself for the labour and seed; what then could be the cause of the loss of the latter, and the gain for the former? It must, I am convinced, be chiefly owing to the agreement or disagreement of the plant with the soil in which it is placed, its situation and aspect; three things of which the farmer knows but little, or ever takes into his calculations. He has but one way of putting in plants, *loading the earth with manure.* But to adapt the plant to the soil from which it originally came, to *suit* also the *manure to both* that they may exactly agree, and not injure the vegetable; that the situation of the plant may be consulted, with respect to humidity and dryness; and that to complete the whole, the *aspect* also may be fitted, so that the plant that *loves* the *sun* may be exposed to it, while that which prefers shade may receive it: these are attentions truly wanting to our agricultural system, as I hope to show.

It has been a subject of considerable inquiry among agriculturists, as in what consists the food of plants. Some have attributed it to water, some to earth, and others to air. To all these sources vegetation is indebted; the fertilizing principle of all manures is referable to the extractive matter arising from decomposed animal and vegetable recrements, and in this state soluble in water, which is the carrying medium into the vegetable substances. Vegetables in general will not grow in pure earth, or pure water; some plants are so organized as to require only mechanical support from the soil, abstracting their nourishment from the atmosphere by means of their leaves; whilst others from their roots depend upon the soil for their support. Although many plants will grow in different soils, yet they have all their favourite ground; and it is more easy to accommodate the plant to the soil than to adapt the soil to the plant. By knowing, therefore, what sort of plant the farmer is going to put in, he may of course be regulated with respect to the quantity and specie of manure required, the aspect wanted, and the degree of humidity and dryness requisite for the plant. All plants came originally from a peculiar earth; either from clay, sand, gravel, chalk, or loams formed from a mixture of some of these, or from a very wet or dry soil; and though many plants will grow indifferently in several species of earth, yet they have all their favourite ground, *that* which they *evidently prefer.* Now to make the soil fit for the plant, is certainly a very expensive thing; but to adapt the plant to the soil, is not only an easy and expeditious mode, but one which requires infinitely less assistance in dressing, labour, seed, and care of every kind. It is true, that all cultivated plants demand some manure, because nature gives not salt and oil *enough in any earth*, to do without *some assistance* of this kind; but the plant that is natural to the soil requires infinitely less than that which is adverse to it, and

may therefore be cultivated at a quarter of the expense. Now nature is so bountiful, that there is scarcely a plant necessary to the food of man and animals, that, if we choose with care, has not *one peculiar sort*, calculated for *every soil.*

Nature has been bountiful in plants peculiarly adapted to *agriculture*, and in which there are *quite as many species* fitted for *poor land*, as for *rich land;* and if planted in their own soils, give an infinitely *greater return*, and are not subject to those *dreadful disorders* but *too common* to plants placed in improper ground. I have repeatedly traced maladies arising from this source, that tainted the very means of life in a vegetable: and being constantly accustomed, when I heard of any extraordinary crop, to proceed to the place, and inquire thoroughly into the causes and management made use of by the farmer, I have generally found the success to proceed from accidentally putting the plant into that ground from which it is originally issued, and manuring it according to the quantum of juices it received from the earth, and with that matter likely to form a proper compound adapted to its wants, in short, attending to its right rules of vegetable economy, and the common process of nature.

But I am sorry to say, that, in manuring the innumerable farms, *diversly situated*, I have but too often found this order reversed, the chalk plant put in sand, the sand plant in clay, and so on: and what is still more, the watery plant put in dry ground, and the dry vegetable in a wet soil; and in all these cases they cannot fail of making a very bad crop. A plant accustomed to a poor soil, placed in a good one, *rots;* while the one which prefers a *rich loam*, is starved in a *poor one.* A clayey plant put in sand, is blown out of the earth, for want of those *retentive powers* the root is used to; while the sand plant, placed in clay, decays at the root from the under moisture which it cannot bear. The chalk plant, also placed in gravel, is destroyed by its own *acidity*, which is *no longer subdued;* for most plants, if the farmer do not grudge the making of the soil, he may certainly do it, but it can never answer in point of expense. It is a strange mistake, and a most fatal one, that almost all, even *some* of our *best gentlemen farmers* fall into, viz: that they cannot manure *too highly.* Now this is so completely the cause of innumerable failures, that I am most anxious to censure the practice. It always reminds me of the account given by Miller, of what was done in the *West Indies*, when some botanists were desirous of bringing over some fine plants of the *cactæ* species. They inquired not what the plants *were*, but wholly inattentive to their being *rock plants*, they put them into tubs of the richest soil they could procure; the *plants all died:* but this was looked upon as an accident, and the same process again followed, when one of the casks breaking they concluded that the plants must die, as the earth had left them; and flinging on them some dry sand

which happened to be in the way, ordered the casks down to the hold, when to their great astonishment the plants so treated *lived*, while those in the other cases died as usual. This opened the eyes of the gardeners with respect to rock plants; but to this day sand plants, instead of having a poor soil, generally receive a rich one. There is not a more ruinous effect than that produced on the plant of a poor soil placed on rich ground.

(*To be continued.*)

ART. XIII.—*Upon the beneficial Effects of protecting the Stems of Fruit Trees from Frosts in early Spring.*

[FROM A REVIEW OF THE TRANSACTIONS OF THE LONDON HORTICULTURAL SOCIETY IN THE GARDENER'S MAGAZINE.]

Circumstances have led Mr. Knight to believe, that whenever a very large portion of the well-organized blossoms of fruit trees falls off abortively in a moderately favourable season, the cause of the failure may generally be traced to some previous check which the motion and operation of the vital fluid of the tree has sustained. A severe frosty night, or very cold winds, during the barking season, is known to give such a check to the flow of sap in the oak tree, as to prevent it from being separated by the peelers till the return of milder weather.

"Neither the health of the tree, nor its foilage, nor its blossoms, appear to sustain any material injury by this sudden suspension of its functions; but the crop of acorns invariably fails. The apple and pear tree appear to be affected to the same extent by similar degrees of cold. Their blossoms, like those of the oak, often unfold perfectly well, and present the most healthy and vigorous character; and their pollen sheds freely. Their fruit also appears to set well; but the whole, or nearly the whole, falls off just at the period when its growth ought to commence. Some varieties of the apple and pear are much more capable of bearing unfavourable weather than others, and even the oak trees present, in this respect, some dissimilarity of constitution.

"It is near the surface of the earth that frost, in the spring, operates more powerfully, and the unfolding buds of oak and ash trees, which are situated near the ground, are not unfrequently destroyed, whilst those of the more elevated branches escape injury; and hence arises, I think, a probability that some advantages may be derived from protecting the stems or larger branches of fruit trees, as far as practicable, from frost in spring."

In support of this conclusion, Mr. Knight refers to an apple tree, which having had its stem and part of its larger branches covered with evergreen trees, had borne a succession of crops of fruit; whilst other trees of the same variety, and growing conti-

guously in the same soil, but without having had their stems protected, had been wholly unproductive; and to a nectarine tree, which having sprung up from a seed accidentally in a plantation of laurels, had borne, as a standard tree, three successive crops of fruit. The possessor of the nectarine tree, with the intention of promoting its growth and health, cut away the laurel branches which surrounded its stem in the winter of 1823–4, and in the succeeding season not a single fruit was produced.

"Never having known an instance of a standard nectarine tree bearing fruit in a climate so unfavourable, I was led to expect that the variety possessed an extraordinary degree of hardness: but having inserted some buds of it into bearing branches upon the walls of my garden at Downton, in the autumn of 1822, I have not any reason to believe that its blossoms are at all more patient of cold than those of other seedling varieties of the nectarine."

A China rose, sheltered by the stem of a plant of Irish ivy, grew and flowered with more than common vigour; and Mr. Knight suggests, that as the ivy, when it has acquired a considerable age, and produced fruit-bearing branches, exhibits an independent form of growth, which these branches retain when detached, if these were intermixed with plants of the more delicate varieties of the Chinese rose, or other low deciduous and somewhat tender flowering shrubs, so that the stems of the latter would be covered in the winter, whilst their foliage would be fully exposed to the light in summer, it is probable that these might be successfully cultivated in situations where they would perish without such protection: and the evergreen foilage of the ivy plants in winter would be generally thought ornamental. Detached fruit-bearing branches of ivy readily emit roots, and the requisite kind of plants would therefore be easily obtained.

As a further experiment with reference to Mr. Knight's reasoning, we would suggest to such as have lately planted an orchard of standard trees, to clothe the stems and principal branches of half of them, during the months of March, April, and May, with loose bands of straw, and to observe the effects in comparison with the other half.

Art. XIV.—*On Planting Corn.*

[FROM THE GENESEE FARMER.]

This should be considered one of the most important operations with the farmer at this season of the year. Every thing appertaining to it should be considered as meriting the strictest attention. These operations may be divided under different heads, viz. the choice of soil, preparation, choice of seed, planting and hoeing.

1st. *Choice of Soils.*—Corn thrives best upon warm, dry, deep soils, and such as contain a sufficient quantity of animal or vegetable matter in a state of decomposition, to render them what is called *strong* or *rich*. Perhaps there are no grounds so well calculated for a profitable corn crop as those which have been for a few years in grass. There are many things to recommend such grounds. 1st. They produce on an average the greatest crops of corn. 2d. Potatoes, which should be planted round the borders of the field, and pumkins, which are planted with the corn, produce better than when planted on grounds which have been two or three years under tillage; and lastly, the crop may be cultivated with as little labour as upon stubble ground, where a proper course of preparation has been followed.

2d. *Preparation.*—In most cases, ground for corn crops is prepared by frequent ploughings, dragings, &c., and lastly, by ridging. The distance of the ridges from each other varying from three to eight feet, according to the variety of corn to be cultivated. There are, in many instances, soils so circumstanced, that by once ploughing they may be put in prime condition for the crop; but for this the soil must be mellow, the surface smooth, and the sward of such varieties of grass as are easily subdued. Were such soils can be turned over flat and even, the decomposing sward is advantageously placed to contribute to the growth of the crop; and by frequently harrowing with a light instrument upon the furrows, sufficient mould may be rendered fine for the operations of planting, hoeing, &c.

It was formerly thought that corn succeded best when planted upon a ridge, and that in the hoeing operation a large hill should be raised about the roots, in order to support the stalks; but at this time we believe this is considered unnecssary, and many farmers declare in favour of keeping the ground as near level as possible through the whole process. Where grounds are to be planted without ridging, a light plough may be drawn through the field by a single horse, running flat and shallow, thereby leaving a smooth place for the hills, which greatly facilitates the first hoeing if done by hand, also the planting may be done more expeditiously. The distance at which corn should be planted, as we have observed, depends much upon the variety.

In this latitude, the small, early corn succeeds well at three feet from row to row; whereas, in Virginia, the larger varieties are frequently planted at six and even eight feet between the rows. The distances at which the common kinds of corn are planted in this section, are from three and a half to four feet between the rows each ways; but we are convinced that more corn is produced from the same land by the same labour when the corn is planted in drills, that is when the rows one way are three and a half to four feet, in which the corn or hill is planted at from twelve to fifteen inches, and from two to three kernels in each, When corn is planted in this way it cannot be ploughed but one way, but if planted in a smooth furrow and the furrow turned from it the first hoeing, and towards it the second, both hoeings will be found easy; and more than two, if the ground is well prepared, will seldom be required. When grass grounds are to be broken up, we recommend corn as the first crop as preparatory to a crop of wheat; after which it may be summer fallowed, as it will occupy the same time as when it is first summer fallowed for wheat, and after planted with corn, and we think when planted first both crops are better.

3d. *Choice of Seed.* On this the quantity as well as quality of the crop depends. Of whatever variety of corn the farmer chooses to plant, he should be sure that it has been judiciously selected. From the small quantity of seed which is required for an acre, the price paid for seed corn becomes of secondary importance when compared with the quality. In the ordinary way of planting, four quarts of corn are considered sufficient to plant an acre. At one dollar per bushel this would amount to twelve and a half cents; but if the farmer paid what would be thought an extravagant price, two dollars per bushel, the same quantity would cost him twenty-five cents. Most farmers, we believe, will be ready to acknowledge that the difference between the product of an acre planted with very good or very poor seed might be ten bushels, which at fifty cents per bushel, would amount to five dollars; and all will allow that the cultivation for the acre of the good would not be any more than for the poor, which would argue that it was as well to pay forty dollars a bushel for very good seed corn, as to have that of an inferior quality at one dollar. If farmers were aware of this fact, they would be more particular about selecting their seed corn; and we are convinced that a difference of five bushels per acre may be made by a careful selection from the same variety of the best specimens for a few years. It is with regard to selecting seed corn, as with improving breeds of cattle, the proportion of the breed may be materially changed without any specific difference. It has long been noticed, that corn produced from seed that was taken only from such stalks as produced two ears, were more apt to produce two ears, than such as was taken from stalks producing

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only one ear. Cross breeding with corn may also be performed as with animals, by which the colour or shape of the kernel, cob, or stalk may be changed at the pleasure of the cultivator, either for amusement or profit.

4th. *Preparation of Seed.* A few years since much was said about soaking seed corn in tar, and then rolling it in plaster of paris preparatory to planting; and the recommendations for this were, that birds would not pull it, and that plaster had a tendency make the young plants more thrifty; but after trying the experiment ourselves, we were satisfied that it did not pay for the trouble. It is now recommended to soak the corn in copperas water, which is said to prevent its being destroyed either by birds or worms, which if true is very important.

5th. *Planting.* As to the time and manner of planting, farmers are pretty well agreed that from the sixth to the tenth of May is the most favourable season; and although the ground is often wet and cold at that time, yet, if it is properly drained so that the water cannot stand upon it, (and no ground should be planted which is not so drained,) there is no danger of the seed rotting if it is good; and although the leaves may look yellow for a time, it will be earlier than corn planted later, and the difference in the time of ripening will be about the same as in planting. It is important in planting, whether in the furrow or on the ridge, to make the hill broad and smooth, as it facilitates the operation of hoeing much.

6th. *Hoeing.* Other business permitting, this should be attended to as soon as the corn is sufficiently up to be readily distinguished, as it is important to check the weeds when young. We have seen an operation performed when the land was smooth and the corn planted in the furrow, as a substitute for hoeing, which was well calculated to save labour. A pair of horses were harnessed to a common harrow having the fore tooth taken out; they were driven one on either side of the row, and the space occasioned by the absence of the tooth allowed the harrow to pass over the corn without injuring it, making the ground mellow on each side.

A boy followed the team to straighten up any hills that might be trodden down by the horses, or covered by the harrow. In this way, two boys and a pair of horses were able to go over six or eight acres in a day; and, although the ground was not exactly as well dressed as when done by the hoe, still, upon mellow land, it was an expedicious way of subduing the weeds. It should always be recollected, that in dry weather, weeds are destroyed with the most ease, and the most effectual way of preventing corn from being injured by drought, is, to hoe it often. Next to potatoes, Indian corn may be considered one of the most important crops grown in our country.

Art. XV.—*Orchard.—On the Management and Pruning of Orchard Trees; by* C. Harrison, Esq.

[from the library of agricultural and horticultural knowledge.]

The situation of an orchard ought uniformly to be one that will admit of a free circulation of air and the direct influence of the sun. It should be well protected on the eastern side, as the blossoms of the trees are frequently injured by cold easterly winds and frosts.

In the following remarks, I propose, in the first place, briefly alluding to the nature of the soil adapted for orchard trees; secondly, the manner of pruning orchard trees; thirdly, the method I adopt for destroying insects, lichen, &c. injurious to the growth of orchard trees.

1. *Soil.*—The subtratum ought to be dry, so that the moisture can be readily carried away, otherwise trees planted will be liable to become stunted in their growth and mossy; and, consequently, unhealthy and unfruitful, or the fruit very inferior in size. Attention to make the ground dry, (provided it is not naturally so) will be amptly repaid, by the greater fruitfulness of the trees. This may be done by trenching over the ground and then, while the trench is open, laying at the bottom a number of brick bats or small stones, &c. and over these something to form an even surface, the whole must be well beaten or rolled, and a number of cross drains so constructed as to conduct the moisture away by one main or central drain.

2. *In Pruning Orchard Trees* care must be taken to prune away the branches so that no two of them rub together, thereby causing them to canker. The interior of the head, ought always to be kept open, otherwise the trees will moss and close up the pores of the wood. Trees always bear more abundantly if trained to and kept in a conical form, the horizontal form of the branches causing them to be more productive of blooming buds than otherwise they would be, and the trees are never so confused in this form as in others. Every winter the trees should be carefully over looked over, and all unnecessary wood taken away, as it is far better both for the health and fruitfulness of the trees to do it every year, than to suffer them to become crowded, and then once in ten or fifteen years cut away large quantities of wood.

4. *Insects, Lichen, &c.*—Persons who have an opportunity of collecting a quantity of suap-suds will find it of essential service to wash the trees with it at any time (except when in bloom) apply it by means of a small engine or syringe. This prevents insects beeding so extensively, as well as prevents moss and lichen increasing.

4. *Thinning the Fruit.*—It is of great importance to thin fruit as far as practicable; not only is the fruit left much finer, but that which is lost in number is more than compensated for by the increased size of those that are suffered to remain. The trees are more certain to mature fruitful buds, to produce fruit the following year, and the alternate bearing of crops is avoided; and each year may be equally successful, (unless by casualties) and not as is often the case, one year loaded to excess, and the following nearly barren. The time to thin the fruit is, when it is beginning to swell.

In addition to the foregoing very excellent remarks of Mr. Harrison, the following plan for forming

An Orchard in Miniature, as proposed by a correspondent in the *Gardener's Magazine*, may, where space is an object, be adopted with advantage.—"By planting the proper sorts apples may be grown *on as small a space of ground as gooseberries:* and a small or large square, according to the size of families, appropriated to apples, will grow every year enough to supply their wants. I am not vain enough to think that I am alone in growing them in this way, as I should think horticultural economy would prompt many besides myself to gratify their eyes, their pockets, and their appetites in so easy a way. I have my ground a strong clay mould, trenched two feet deep, in December; as soon as it is settled, say a fortnight after trenching, taking advantage of a frosty morning, the holes are opened and left for the frost to mellow. February is the best month for planting on heavy ground; by that time the earth taken from the holes will be in a fine pulverized state. The holes need not be very large; two feet over, and one and a half feet deep, will be enough; with some rich soils there will be no occasion for trenching; but then the holes must be larger, say three feet over, and two feet deep; the plants must be six feet apart every way; I arrange mine in quincunx. With a six feet measuring stick this is done with scarcely any trouble. I really do not know any sight more pleasing to a domestic mind (or what fruit contributes more to our comfort than the apple?) than this orchard in miniature, when covered with bloom, and again when laden with fruit, as they seldom miss bearing in abundance.

This plan will not extend to the strong-growing sorts, as they are not easily kept within bounds; but the following six will amply repay the trouble and trifling expense of planting. I have placed them in the order of their ripening:—Mank's Codlin, Hawthornden, Kerry Pippin, Downton's Pippin, Christie's Pippin, and the old Golden Pippin. The trees must be chosen with stems not exceeding one foot six inches in height. In September I look over the trees, take off superfluous wood, and shorten the long shoots; this strengthens the bloom buds, which are formed abundantly upon the young wood of all the sorts named.

Of course in doing this an eye must be had to the formation of the trees, which ought to be gradually brought into a handsome round bush. For the first five years a row of strawberries may be grown, between each row of apples or any other dwarf light crop; but strawberries are most in keeping, a word which, in every gardening operation ought never to be lost sight of. Let me add—they ought to be worked on Paradise stocks, or the small wild crab (mine are on the last) not by any means on the free stock raised from apple pips, the very worst that can be used.

Another correspondent (Mr. Howden we believe) in the 17th number of the very useful and interesting publication above alluded to, thus describes a very ingenious "plan for planting a piece of ground to the greatest advantage." In the winter of 1814–15, on account of some alterations of roads, plantations, &c., a piece of land dropped into my hands, of an awkward shape for tillage, and rather too small for pasture; I therefore concluded to introduce a little spade husbandry; as the house was pretty near to the farm-yard, the intercourse or advantages betwixt them would be reciprocal. Accordingly, having no gardeners, I set farm labourers to make so many ditches, four feet wide and two feet deep, at every twelve yards, clear across the whole; the turf and good soil were thrown on one side, and the bad soil on the other. The labourers wondered what such ditches could mean, as they were as wide at bottom as at top, and particularly when I ordered them to be filled up a foot thick with fresh farm-yard dung: and the turf, and what little good soil there was, chopped and thrown on the top of the dung. I had prepared a compost of turf and dung the year before, which was laid upon the whole, about nine inches thick, in which I planted fruit trees in the following order:—at every six feet, in the centre of what I now call a border, was planted a standard, then a gooseberry, then a currant, then a dwarf, then a currant, then a gooseberry, then a standard, &c. I was not so particular as some are in my choice of fruit trees; I gave my nurseryman a kind of roving commission, to send me a couple of each of such as he could recommend, and then added two, four, six, or eight of such as I could recommend myself. On the edges of the borders I planted rows of strawberry plants, six inches apart, which I have only renewed about twice in ten years; the fruit is always excellent, and supplies a large family all the strawberry season, which saves much garden ground for that crop. The spaces betwixt the borders, I cultivated at my leisure; some were appropriated for nursery ground, some for potatoes, peas, cabbages, &c.; some for experimental agriculture, lucern, mangold wurzel, &c. The orchard has succeeded beyond my utmost expectations. I had forty-eight apples from two Keswick Codlins the first year, but have never had patience

to count them since; last year I had at least seven bushels off the same two trees! Six dwarf Hawthorndens produced above fifteen bushels, and I have, at this moment, two bnshels of Wyker Pippins from one graft of my own putting in, only ten years ago. Two Dumelow's seedings, planted twelve years ago, produced at least eight bushels of beautiful fruit, scarcely one of them less than ten inches round, and many of them twelve inches. The nonpareils are a very similar crop; as for the Mank's apple, &c. there are generally as many apples as leaves; and when in blossom they seem an entire bunch of flowers.

My method of Pruning is particularly simple. It will remind you of the old way of pruning, or rather cropping the vines at the third eye. I do not stand counting eyes, but from every shoot that is three feet long, I cut off two, and of course leave one, from such as are three inches long, I cut off two and so on. The wood left form buds for the following year, and as the tree gets crowded and out of shape, I take off a whole bough or branch with a saw. Any boy will learn to prune in a few minutes. [The lopping of trees, here suggested is, we must confess, a rather too unceremonious more of procedure to be recommended as a substitute for the skilful application of the pruning knife.—*Ed.*] I cut out the large boughs myself. A few of my trees took to cankering, the Ribston Pippin particularly; my only remedy was to dig them carefully up, examine and prune both root and branch carefully, and plant them again in similar fresh soil; they never miss to recover and do well. My extraordinary success has, induced me to write this, *pro bono publico*, as it has been the custom in this country, and many others, to prepare a foundation for fruit trees, at vast expense, by flagging, paving a gravelling in Mr. Harrison's manner, lest the roots get into the bad soil and canker, as the saying goes; but trees will never go into bad soil if they will have plenty of good soil to go into, any more than cattle will go into bad pasture if they have plenty of a better quality. The roots of fruit trees do not and should not run deep into the soil; the borders should be occasionally top-dressed with good manure, and the alleys sometimes dug deep and fresh manure put into them. My borders are now full six feet broad, and the spaces between of course a little curtailed. I used to grow five rows of celery in the intervals, and now I grow but four, but the fruit trees pay well for the ground they occupy."

A very excellent paper on the pruning and management of dwarf apple and pear trees, is published in the seventh volume of the Transactions of the Horticultural Society, in a letter addressed to the Secretary, by Mr. W. Greenshields, F. H. S.:—"I herewith send you (says Mr. G.) a description of the method I have pursued in pruning and managing my dwarf standard apple and pear trees, and which I have practised for several years with success.

The first subjects of the following remarks, from their appearance, were planted six or seven years previously to the commencement of any pruning being given them. In consequence they required to be very much thinned out, so as to get the branches clear of each other. For thinning I alway bore in mind to cut the old wood off close to the stem or branch it was attached to; this prevented young wood springing afterwards. When the trees were thinned of the old shoots, as above stated, the young side shoots were what is generally termed spurred in; that is, they were so shortened, that only two or three buds were left on them, and the leading top shoots were shortened to half their length.

The following and every succeeding year, the trees were treated in the same manner, as respects the young wood, till they had acquired the desired height, when the leading shoots were shortened, as the side shoots or spurs had been previously. When the leading shoots shew an indication to grow very luxuriantly, which is apt to be the case under this treatment they should be prevented doing so, by cutting off part of the old wood, along with the young shoots immediately above a flower bud. This will prevent the shoot so cut from increasing in length. The spurs must be treated in a similar manner, by cutting off a small portion of the old wood along with the young, when they are getting too long. I have never found the above treatment prevent the fruit swelling, or in any way detrimental to it; but on the contrary, it was always improved.

Young trees are to be treated in the following manner:—If there are more than three shoots on the plant, reduce them to that number, and shorten each to three, four and six eyes, according to their strength. The following season reduce the number of leading shoots to six, and shorten them to three-fourths of their length, and spur in the remaining shoots. The tree should be managed in every respect in this manner until it has attained the required size, which of course depends on the convenience or fancy of the owner, or conductor of the garden.

I make a point of letting the trees take their natural form of growth as far as the system described will permit; for I consider it of little consequence what shape is given to the tree, provided my end is attained; that is, to make every branch as it were a long spur, with bearing buds from the base to the extremity.

Two or three years' trial of this method only, might possibly deter many from a continuance of it, in consequence of the quantity of young wood which will be produced yearly at first, and from the apparent difficulty of getting rid of the superfluity. But the inconvenience will be ultimately surmounted if the foregoing instructions are attended to, and the continuance will be the possession of both healthy and fruitful tree. To attempt to bring

very old trees into this method of management would be attended with difficulty, unless they were cut down short, and allowed to make new heads, which I should recommend where their produce can be spared for a time. In a few years fine healthy heads would be formed, which will yield fruit superior to any that could be expected from them, if left in their rude state. But if the trees cannot be spared to be headed down, they may be very much improved by thinning out the spray, and cutting out a few old branches, which will cause them to throw out young shoots, and these, in a short time, will become bearing wood. The remainder of the old branches may then be thinned out with effect. Even if this process is only performed once in two or three years, and the stems and branches well cleared of moss and dead bark, it will be of great service to the trees, and be a means of keeping them free from insects, and give them a neat and clean appearance.

Art. XVI.—*The Flower Garden.*

[FROM THE GENESEE FARMER.]

As remarked in last week's Farmer, this month is of the utmost importance to farmers and gardeners, and no opportunity should be allowed to pass which is favourable for gardening operations. Every vacant piece of ground should be turned up in ridges; or left in a level manner in as rough a state as possible; and when either a kitchen or flower garden is to be formed, there is no season more proper for executing the work. Many choice flowers cannot be planted at any other season with so much advantage as in the month of November. This is decidedly the case with hyacinths, tulips, lilies, jonquils, crocus, ranunculus, anemones, &c., &c.; and as no tribe of plants are more ornamental in the vernal months, nor require less trouble in their cultivation, we hope to see them displaying their unrivaled beauties in every garden. As we promised at the commencement of our connexion with the 'Genesee Farmer,' to dedicate a portion of its pages to the improvement of gardening, as an art of design and taste, we shall now offer a few remarks on the formation of a flower garden; and as we expect to see many rising up around us, we infer those observations and hints may be generally acceptable.

As respects the site, exposure, and soil, best adapted for a flower garden, whether large or small, we consider, where practicable, the former should be southeast or southwest of the house; in exposure and aspect, a south exposure is preferable, in general; but if part is facing either the southeast or east, a prolonged display of flowers will be obtained from the same species. South, southeast, or east, are the aspects most advantageous to the growth of flowers; and, possessing these different exposures, the bloom of a garden may be protracted some weeks beyond the time it would be preserved under a single aspect.*

The surface should not be naturally low, nor rendered damp and gloomy by high trees, walls, or buildings. The soil should be moderately light and mellow, but not of a wet, retentive nature. Most hardy herbaceous flowers and ornamental shrubs, will succeed in a soil of common good qualities, although in parterres, where finer flowers are cultivated, a variety would be desirable. The depth should be two spades, or about eighteen inches deep, and the whole well enriched with very rotton cow dung, or the leaves of trees (not resinous) perfectly decomposed, which are decidedly the best manures for plants in general.

In the formation of a flower garden, much will depend on the taste and fancy of the owner. As flower gardens are objects of pleasure, the principle which must serve as a guide in laying them out must be taste, consequently they will vary according to taste, or according to extent or other contingent circumstances. The shape, if the garden is small, may be of some regular figure, as a circle, oval, octagon, cresent, &c., but a variety of figures may (according to first rate garden artists) be indulged in without incurring censure, provided the figures be graceful, and not in any one place too complicated. An oval is a figure that generally pleases, on account of the continuity of its outlines; next, if extensive, a circle; next, perhaps, a segment, in form of a half moon, or the larger segments of an oval. But hearts, diamonds, triangles, or squares, if small, seldom please. A simple parallelogram, divided into beds running lengthwise, will always please; or the larger segment of an oval, with beds running parallel to its outer margin, is also always very pleasing to the eye.

In laying out the area, the figures may be of various shapes, but on no account should they be regularly distributed over the surface, and should invariably be accommodated to the turns of the walks, and so fitted to their situations relatively to each other as not to admit of being removed or changed in position without deranging the effect which would deprive it of expression or character.

* Although those aspects are decidedly the best, it does not follow that, when they are not to be obtained, a flower garden cannot be made with advantage; this is by no means the case. Many plants will grow luxuriantly and flower freely under any aspect. The only point requisite is to adapt the proper plants to their respective situations.

In general cases it ought to form a whole, which may be accomplished in various ways, accommodating to surrounding circumstances, but always preserving an outline of definite character; that is, a well arranged whole in opposition to something that is in a state of chaos and confusion. A flower garden will always have a more pleasing effect when composed of curved lines, than if bounded by straight lines and angles; curved walks, also, are handsomer than straight. Flower beds form a less handsome flower garden, when placed over the surface without arrangement and connexion, than when the whole are composed into one general figure.

Gardening, as an art of taste, and design, although it may be varied considerably, is based on just and fixed principles; and "those principles, (says the ingenious Mr. Loudon) as an art of imagination, are those of painting; and as an art contributing to the convenience and comfort of man, it is directed by those of fitness and utility, and must be guided by unity of expression as to the whole or general effect, and by the connexion and co-operation of the component parts." As a guide to any individual laying out a pleasure garden, whether large or small, the following rules, if strictly followed, will prevent him from falling into glaring errors, or deviating very widely from the basis on which its principles are founded.

1. No bed or group ought to be so placed but that it should fit into the precise situation, so that if moved either way the effect of the whole would be deranged.

2. When the area is of an irregular shape, regular figures should be very sparingly introduced.

3. All figures should be long and narrow, rather than round and lumpish, which produces most effect with least ground, and is more convenient for attending the flowers.

4. Groups should be placed near the walks, but, when they extend into the centre, they should be in clusters, and not sprinkled over regularly with circles, ovals, hearts and diamonds, without any connexion among themselves or the objects that surround them.

PART III.

MISCELLANEOUS INTELLIGENCE.

Curious Ear of Corn.—We have had a singular ear of corn left at our office. It consists of a perfect ear, entirely surrounded by five others, all growing from the same pedicle. The appearance, until examined, is only of one large ear, so closely do the others join; but on more closely inspecting it, it is found that each of these are detached the whole way down, and that the inner ear is round and as full of grain as is usual, that is to within an inch or two of the top. The outer ears have no grain on the side next to the inner, in other respects they are perfect. This singular production is left for the inspection of the curious.

New Species of Cotton.—Mr. Burrell Lyles, who resides on the river road, between Cannon's and Hellor's creek, in Newberry District, brought to this market a few days since, three bales of cotton in store at Messrs. Woods & Subers', the staple of which good judges say is superior to any that has been seen here, and 11 cents has been offered and refused. I learn from Lyles that some four years ago he discovered in his crop a single stalk, remarkable for its height, and a number of pods which came to maturity and opened earlier than the rest. He saved and planted the seed from this stalk separately, from year to year, and this year he was enabled to plant about fourteen acres. The soil is of medium quality of upland, and the average height of the stalk about eight feet—occasionally they shoot up to the height of twelve or thirteen feet, and he calculates the product at an average of a bale of three hundred and twenty-five pounds to the acre. The writer has seen a part of Mr. Lyles' crop, and knows that the description of the growth is not exaggerated and with some knowledge of cotton planting, thinks confidently that the product is not overrated. The contrast between that and the adjoining crop of the common stalk, upon lands of the same quality, is so great as to force it upon the attention of the mere passenger.

Mr. Lyles has thus given a practical illustration of the advantages which may be expected to result from a proper attention to the selection of seed for planting in all the departments of agriculture, and it is to be hoped that in the sale of his seed he will reap the reward due to his care. For the present he has contracted to dispose of all or most of his stock at a moderate price in such quantities as to disseminate it pretty generally through that part of the country in which he lives, and if the anticipations of it are realized, in a few years it will be worth more to South-Carolina, than would be the combined products of all the gold mines of North-Carolina, South-Carolina and Georgia. D. J.—*Columbia (S. C.) Telescope.*

Cotton Seed for Hogs.—Mr. Editor—I will take this opportunity of mentioning, for the benefit of your readers, a method I have successfully adopted of feeding hogs with cotton seed.

I take seed fresh from the gin, sprinkle them with a little salt and feed with them in quantity nearly as much as they can consume, though I do not suffer

my hogs to have free access to them, at the same time they are allowed a small portion of corn. I was told by my neighbours, when I commenced this plan, that my hogs would be destroyed, particularly the young ones, many of them having known instances of cotton seed proving fatal to hogs. Now a fruitful source of error, and one which has brought this article of diet into disrepute, is the suffering of hogs to feed at banks of seed, and not apportioning the seed to them, they thrive fast for awhile, but for the want of some other nutriment, or perhaps of salt, some disease is generated which occasionally proves fatal.

With less than one third of the corn usually given, hogs may be kept in fine order, without any risk of future consequences, if the above precautions are observed. Let those who are in doubt, try it on a small scale and they will become satisfied that this very abundant and cheap article of food may be liberally used in rearing and fattening these animals. Respectfully,

W. A. Stewart.

Burnt Corn, (Ala.) Nov. 29, 1832.—Sou. Planter.

Calves.—There is no part of the live stock upon a farm that requires more care through the month of November and December than calves. We do not believe it a matter of economy to allow stock of any description to become poor at any time, but if one part suffers more by it than others, at any particular time, we believe it is when calves are allowed to become poor the first fall and winter. The condition which a young creature is kept the first year has a wonderful effect upon its future shape and size. Unless there is some pains taken to learn calves to eat meal or grain before the weather becomes cool, they appear to lose their appetite for food; and it will be found much more difficult to effect it than when commenced in time, and while they are in flesh and spirits. By placing a small trough in the field where calves are pastured, and supplying them with salt and meal, boiled potatoes or pumkins alternately, they soon become fond of such extra food, even while grass is yet fresh and plenty; and by increasing the quantity as the frost destroys the nutriment of the pastures, they may be kept through the first winter with less risk and trouble than when they are allowed to become poor in autumn. For a general rule, young cattle, that were kept in high flesh the first winter, will be as fit for market at three years old, as they will at four where they were stinted in their growth the first winter by starvation.—*Gen. Far.*

Breaking Steers.—Yoke them carefully, and let them remain quiet until they will eat their food, which generally takes place in the course of one day. Yoke them again the next day, and put them behind a pair of old steady cattle, and let them stand till they become familiar with them. This generally takes but one day. The day following yoke them again, and put them behind the oxen as before, put them upon the tongue of a cart or sled. They being now accustomed to the oxen before, they will readily follow, without whipping or beating. They will soon become kind and gentle.—*Rural Economist.*

Bees.—Mr. Editor—I noticed in the 41st Number of the second volume of the Genesee Farmer, a communication respecting the bee moth, which I think incorrect. As the raising of bees is of much importance, I think that any information resulting from experience will be acceptable to your readers, and therefore I will give my method of treatment.

Until experience has taught me better, I allowed my hives to be placed upon a board, as was the practice with my neighbours. By this treatment I lost several swarms, and others received much injury; for, unless the hive is nicely fitted to the board, the moth will deposit her eggs under the edge of the hive, and when they hatch, the worms are so very small that they will crawl into the hive during the night time, unperceived by the bees; and after they have located themselves, and spun a few webs over their habitation, they are seldom driven from it by the original proprietors.

For five or six years past, my practice has been to support my hives upon small blocks or nails driven into the bottom of the hive, which shall prevent its coming withing half an inch of the bottom board. The result of this practice has been favourable, for I have not had a swarm injured in the least by moths since I adopted it. I suspect that a hive alluded to by Mr. Andrews, was one in which the eggs of the moth had been deposited previous to its being elevated. It is to be hoped that others who have paid attention to bees will give the results of their different experiments, whether successful or unsuccessful, that the most profitable method may be adopted. W.

Sweden, Nov. 1832.—*Gen. Far.*

New Chinese Mulberry (*morus multicaulis*).—The excellent qualities of this species of mulberry for silkworms, are every day receiving new illustrations. A friend in Virginia writes to us that he had a leaf from one of his trees that measured fifteen inches in length, and thirteen in width; and that thirty-six leaves, medium size, after exposure one day to the hot sun in September to evaporate their moisture, weighed twelve ounces.—*Amer. Farmer.*

Silk Cocoons.—We have received, from Miss Parmentier of Brooklyn, two baskets of silkworm cocoons, for exhibition at the approaching Fair of the American Institute. They consist of two broods spun the present season. Those of the second are much larger than the first, and what is of more importance, all are of a beautiful white colour. We hope every lady in our country, who has given attention to the rearing of silkworms, will imitate Miss P., by exhibiting, at the Fair, specimens of their cocoons, and, if convenient, accompanying them with statements of their mode of management. By so doing they will set a laudable example, and promote the welfare of their country. The following has been politely furnished by Miss Parmentier.

The silkworms of the first brood were hatched May 9, 1832. They were fed on the *morus alba* (or white Italian mulberry), *morus multicaulis* (or Chinese many-stalked mulberry), *morus alba macrophylla*, and other varieties. The litters were changed every second day. The result of this mode of feeding was that the worms were in excellent health, and that the cocoons were about two-thirds white, and the remaining straw-coloured. The eggs which produced the worms of the second brood were from cocoons selected from the first brood, without regard to colour; care, however, having been taken to set aside those cocoons only, which were of approved form.

The worms of the second brood were hatched July 30. These were fed exclusively on the *morus multicaulis*. A proof of the excellence of this mulberry is, that the silkworms of this brood, which had received the same care as those of the first, completed the different stages of their existence in the short period of *twenty-six* days. The cocoons obtained from this brood were all of a perfect snow whiteness. If experience should prove that silkworms fed entirely on the *morus multicaulis*, invariably produce white cocoons, it appears evident that this will add another invaluable advantage to those which this tree is already known to possess—it being perfectly hardy, always preferred by the worms to any other kind, having abundance of large leaves that require but a little time to gather them, and constantly putting forth branches, and leaves that always afford food suitable for the different ages of the insects.—*N. Y. Farmer.*

Culture of the Carnation.—The flowers are propagated either by seed or by layers; the first is the method for raising new flowers; the other is the way to preserve and multiply those of former years. To raise them from seed—that from the best double flowers should be selected, which will produce the strongest plants, and should be sown in April in pots or boxes of fresh light earth, mixed with rotten cow manure, exposed to the morning sun, and occasionally watered. In a month the plants will appear, and in July should be transplanted into the beds of the same earth, in an open airy situation, at six inches distance, and there left to flower. When in flower, the finest kinds

should be marked, and all the layers that can be, should, during the time of flowering be laid down from them; these will have taken root by the end of August, and are then to be taken off and planted out in pots in pairs.

E. Rudge, F. R. S.—*Loudon's Gard. Mag.*

Vegetation.—The celebrated Dr. John Mason Good, when writing on the different stimulants contained in the atmosphere, which are beneficial to vegetation, says—"Ammonia is a good stimulus, but oxygen possesses far superior powers, and hence without some portion of oxygen few plants can ever be made to germinate. Hence, too, the use of cow dung and other animal excrements, which consist of muriatic acid and ammonia: while in fat, oil, and other fluids, that contain little or no oxygen, and consist altogether, or nearly so, of hydrogen and carbon, seeds may be confined for ages without exhibiting any germination whatever. And hence, again, and the fact deserves to be extensively known, however torpid a seed may be, and destitute of all power to vegetate in any other substance, if steeped in a diluted solution of oxygenated muriatic acid, at a temperature of about 46° or 48° of Fahrenheit, provided it still possesses its principle of vitality, it will germinate in a few hours. And if, after this, it be planted as it ought to be, in its appropriate soil, it will grow with as much speed and vigour as if it had evinced no torpitude whatever."

I can bear testimony to the efficacy of the system recommended in the latter part of the above extract. In the latter part of 1826, I received several packets of seeds which had come from the Cape of Good Hope and New South Wales, with part of which I made several efforts on various plans to cause their vegetation, but I was invariably unsuccessful. The residue of my chance were put in my trunks, and there remained until the fall of 1828, when I first read Dr. Good's method. I immediately made the experiment, and with the greater part I was perfectly successful. I may add that, during the interim, they had twice crossed the Atlantic with me, and been as far south as the 31° of north latitude.

Alexander Gordon.

Main-street, Oct. 1, 1832. [*Genesee Farmer.*

Buffalo Berry Trees (*shepherdia*).—A gentleman in Boston, who has the original tree of this excellent and elegant new fruit and ornamental tree, in a letter to us, says—"You will find a description of the *shepherdia* in the 'American Farmer,' from Jonathan Winship, Esq. Next season we will send you a large branch of the tree in fruit. Our tree is eighteen feet high, and when in fruit truly magnificent; gratifying to both the eye and the palate. Fancy to yourself the red currant growing in compact spikes, about the diameter of a small ear of corn, and much more closely set than kernels of corn, on every large and even the smallest offsets, and you may have some idea of the beauty and elegance of this tree."—*Amer. Farmer.*

Cheap Fodder.—Sir: I observe on page 80 of your current volume, that there was, during the spring, a scarcity of provender for your cattle. Our farmers make a very cheap fodder, which, as it may not be generally known in America, I take the liberty to communicate to you.

It is made of wheat chaff, or cut straw, and chopped potatoes mixed. It is prepared as follows:—A common boiler is set in a furnace. Water, to the depth of a few inches, is first put in; and then a bottom fitted in over the water, with holes bored in it. The boiler, or kettle, is then filled with the straw and potatoes, and steamed until the potatoes becomes soft. This is found to be an excellent and cheap fodder for cattle, milch-cows, &c.

Several large farmers have got steam apparatus made expressly for the purpose, which they consider to pay well. In my next, I hope to give you a description of them. Yours,

M. Saul.

Lancaster, Eng. Sept. 1832. [*N. Y Farmer.*